DVP-C660/C670D/C675D

RMT-D119A/D121A/D1210

SERVICE MANUAL

US Model
Canadian Model
DVP-C660/C670D
E Model
Australian Model
DVP-C670D
PX Model
DVP-C675D

Self Diagnosis Supported model

Photo: DVP-C670D

SPECIFICATIONS

CD/DVD player

Laser: Semiconductor laser

Signal format system
- NTSC (C660/C670D: US, Canadian/C675D)
- NTSC/PAL (C670D: Australian, E)

Audio characteristics

Frequency response
- DVD (PCM 96 kHz): 2 Hz to 44 kHz (±1 dB)* (C660)
- DVD (PCM 96 kHz): 2 Hz to 44 kHz (±1.0 dB) (C670D: Australian, E)
- DVD (PCM 96 kHz): 2 Hz to 44 kHz (±0.5 dB) (C670D: US, Canadian/C675D)
- DVD (PCM 48 kHz): 2 Hz to 22 kHz (±0.5 dB)
- CD: 2 Hz to 20 kHz (±0.5 dB)

Signal-to-noise ratio
- More than 110 dB (AUDIO OUT connectors only) (C660/C670D: Australian, E)
- More than 115 dB (AUDIO OUT connectors only) (C670D: US, Canadian/C675D)

Harmonic distortion
- Less than 0.0025% (C670D: US, Canadian/C675D)
- Less than 0.003% (C660/C670D: Australian, E)

Dynamic range
- More than 100 dB (DVD)
- More than 97 dB (CD) (C660D/C670D: Australian, E)
- More than 98 dB (CD) (C670D: US, Canadian/C675D)

Wow and flutter
- Less than detected value (±0.001% W PEAK)

Outputs/Inputs

	Jack type	Output/input level	Load impedance
AUDIO OUT (1, 2)	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OUT (OPTICAL)	Optical output connector	–18 dBm	Wave length: 660 nm
DIGITAL OUT (COAXIAL)	Phono jack	0.5 Vp-p	75 ohms terminated
VIDEO OUT (1, 2)	Phono jacks	1.0 Vp-p	75 ohms, sync negative
S VIDEO OUT (1, 2)	4-pin mini DIN	Y: 1.0 Vp-p C: 0.286 Vp-p	75 ohms, sync negative 75 ohms terminated
COMPONENT VIDEO OUT (Y, P_B/B-Y, P_R/R-Y)	Phono jacks	Y: 1.0 Vp-p P_B/B-Y, P_R/R-Y: 0.7 Vp-p	75 ohms, sync negative 75 ohms
5.1CH OUTPUT (C670D/C675D)	Phono jack	2 Vrms (at 50 kilohms)	Over 10 kilohms
S-LINK (C670D: US, Canadian/C675D)	Mini jack	–	–
PHONES (C670D/C675D)	Phone jack	12 mW	32 ohms
MEGA CONTROL	Mini jack	–	–
AUDIO IN	Phono jack	2 Vrms	47 kilohms

General

Power requirements
- 120 V AC, 60 Hz (C660/C670D: US, Canadian)
- 220 V – 240 V AC, 50/60 Hz (C670D: Australian)
- 110 – 240 V AC, 50/60 Hz (C670D: E/C675D)

Power consumption
- 14 W (C660)
- 17 W (C670D: US, Canadian)
- 18 W (C670D: Australian, E/C675D)

Dimensions (approx.)
- 430 × 95 × 410 mm ($17 \times 3\,^3/_4 \times 16\,^1/_4$ in.) (w/h/d) incl. projecting parts (C660)
- 430 × 95 × 414 mm ($17 \times 3\,^3/_4 \times 16\,^3/_8$ in.) (w/h/d) incl. projecting parts (C670D/C675D)

Mass (approx.)
- 5.3 kg (12 lb 2 oz) (C660)
- 5.4 kg (11 lb 14 oz) (C670D/C675D)

Operating temperature
- 5 °C to 35 °C (41 °F to 95 °F)

Operating humidity
- 25 % to 80 %

Supplied accessories

- Audio/video connecting cord (1) (C660/C670D: Australian, E)
- Audio/video/S-link connecting cord (1) (C670D: US,Canadian/C675D)
- S video cord (1)
- Remote commander (remote) (1)
- Size AA (R6) batteries (2)
- Plug adaptor (1) (C670D: E/C675D)

** The signals from AUDIO OUT connectors are measured. When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL, COAXIAL) are converted to 48 kHz (sampling frequency).*

Design and specifications are subject to change without notice.

DVD VIDEO COMPACT disc DIGITAL VIDEO **CD/DVD PLAYER**

SONY®

Settings and Adjustments

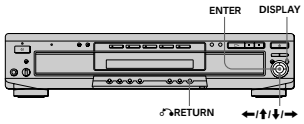
This chapter describes how to set and adjust the player using the on-screen setup menu. Most settings and adjustments are required to be set when you first use the player.
This chapter also describes how to set the remote for controlling the TV or the AV receiver (amplifier) or the CD changer.

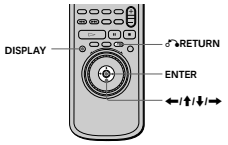
Using the Setup Display

DVD VIDEO CD CD

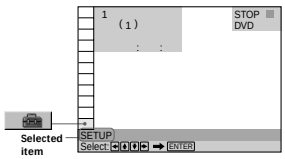
Using the setup display, you can do the initial setup, adjust the picture and sound and set the various outputs. You can also set a language for the subtitles and the setup display, limit playback by children, and so on.
For details on each setup display item, see pages 59 to 69.

Note
You can display the setup display only when the player is in stop mode.



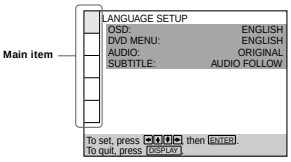


1 **Press DISPLAY and select "SETUP" using ↑/↓.**

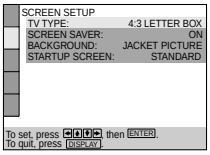


2 **Press ENTER.**
The setup display appears.

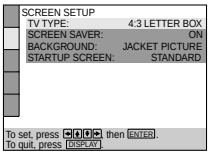
3 **Select the main item you want using ↑/↓.**



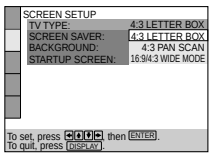
4 **Press ENTER.**
The selected main item is highlighted.



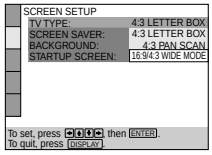
5 **Select the item you want using ↑/↓.**



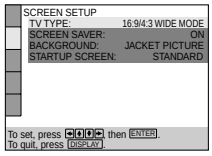
6 **Press ENTER.**


SCREEN SETUP
TV TYPE: 4:3 LETTER BOX
SCREEN SAVER: 4:3 LETTER BOX
BACKGROUND: 4:3 PAN SCAN
STARTUP SCREEN: 16:9/4:3 WIDE MODE
To set, press ↑↓←→ then ENTER.
To quit, press DISPLAY.

7 **Select the setting you want using ←/↑/↓/→.**


SCREEN SETUP
TV TYPE: 4:3 LETTER BOX
SCREEN SAVER: 4:3 LETTER BOX
BACKGROUND: 4:3 PAN SCAN
STARTUP SCREEN: 16:9/4:3 WIDE MODE
To set, press ↑↓←→ then ENTER.
To quit, press DISPLAY.

8 **Press ENTER.**



9 **Press DISPLAY.**
The setup display disappears.

10 **Press DISPLAY repeatedly to turn off the on-screen menu.**

To return to the previous screen
Press RETURN.

To quit while making a selection
Press DISPLAY.

Note
Some setup display items require operations other than selecting the setting. For details on these items, see the relevant pages.

Setup Display Item List

The default settings are underlined.

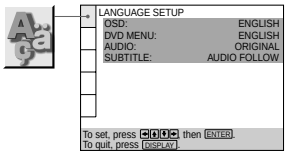
- **LANGUAGE SETUP** (page 59)
  - OSD: ENGLISH, FRENCH, SPANISH, PORTUGUESE
  - DVD MENU: ENGLISH, FRENCH, SPANISH, PORTUGUESE, GERMAN, ITALIAN, DUTCH, CHINESE, JAPANESE, DANISH, SWEDISH, FINNISH, NORWEGIAN, RUSSIAN, OTHERS ➡
  - AUDIO: ORIGINAL, (same as DVD MENU)
  - SUBTITLE: AUDIO FOLLOW, (same as DVD MENU)
- **SCREEN SETUP** (page 60)
  - TV TYPE: 4:3 LETTER BOX, 4:3 PAN SCAN, 16:9/4:3 WIDE MODE
  - SCREEN SAVER: ON, OFF
  - BACKGROUND: JACKET PICTURE, PICTURE MEMORY, GRAPHICS, BLUE, BLACK
  - STARTUP SCREEN: STANDARD, PICTURE MEMORY
- **CUSTOM SETUP** (page 61)
  - AUTO PLAY: OFF, TIMER, DEMO1, DEMO2
  - DIMMER: BRIGHT, DARK, OFF
  - PAUSE MODE: AUTO, FRAME
  - BOOKMARK RESET ➡
  - PARENTAL CONTROL ➡
  - PLAYBACK MEMORY: ON, OFF
  - TRACK SELECTION: OFF, AUTO
- **AUDIO SETUP** (page 65)
  - AUDIO ATT: OFF, ON
  - AUDIO DRC: STANDARD, TV MODE, WIDE RANGE
  - CENTER SPEAKER EQ: FLAT, ENHANCED, SOFT
  - DOWNMIX: DOLBY SURROUND, NORMAL
  - DIGITAL OUT: ON, OFF
    - DOLBY DIGITAL: D-PCM, DOLBY DIGITAL
    - DTS: D-PCM, DTS
    - 48kHz/96kHz PCM: 48kHz/16bit, 96kHz/24bit
- **SPEAKER SETUP** (page 67)
  - SIZE: FRONT, CENTER, REAR(REAR/SIDE), SUBWOOFER
  - DISTANCE: FRONT, CENTER, REAR
  - BALANCE: FRONT, REAR
  - LEVEL: CENTER, REAR, SUBWOOFER
  - TEST TONE: OFF, ON

Setting the Display Language or Sound Track (LANGUAGE SETUP)

DVD VIDEO CD CD

"LANGUAGE SETUP" allows you to set various languages for the on-screen display or sound track.
The default settings are underlined.

Select "LANGUAGE SETUP" in the setup display.



Notes
- When you select a language that is not recorded on the DVD, one of the recorded languages is automatically selected for the "DVD MENU," "AUDIO" and "SUBTITLE" settings.
- Depending on the DVD, the player may not start playing with the selected language even when you select a language in "DVD MENU," "AUDIO" or "SUBTITLE."

■ OSD (On-Screen Display)
Selects the language for the on-screen display.
- ENGLISH
- FRENCH
- SPANISH
- PORTUGUESE

■ DVD MENU
Selects the language for the DVD menu.
- ENGLISH
- FRENCH
- SPANISH
- PORTUGUESE
- GERMAN
- ITALIAN
- DUTCH
- CHINESE
- JAPANESE
- DANISH
- SWEDISH
- FINNISH
- NORWEGIAN
- RUSSIAN
- OTHERS➡

When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 81).
After you have made a selection, the language code (4 digits) is displayed.

■ AUDIO
Selects the language for the sound track.
- ORIGINAL: the language given priority in the disc
- ENGLISH
- FRENCH
- SPANISH
- PORTUGUESE
- GERMAN
- ITALIAN
- DUTCH
- CHINESE
- JAPANESE
- DANISH
- SWEDISH
- FINNISH
- NORWEGIAN
- RUSSIAN
- OTHERS➡

When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 81).
After you have made a selection, the language code (4 digits) is displayed.

■ SUBTITLE
Selects the language for the subtitles.
- AUDIO FOLLOW*
- ENGLISH
- FRENCH
- SPANISH
- PORTUGUESE
- GERMAN
- ITALIAN
- DUTCH
- CHINESE
- JAPANESE
- DANISH
- SWEDISH
- FINNISH
- NORWEGIAN
- RUSSIAN
- OTHERS➡

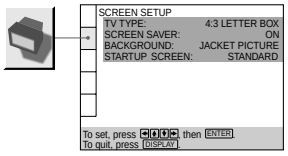
When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 81).
After you have made a selection, the language code (4 digits) is displayed.

* When you select "AUDIO FOLLOW," the language for the subtitles changes according to the language you selected for the sound track.

Settings for the Display (SCREEN SETUP) DVD VIDEO CD CD

"SCREEN SETUP" allows you to set the display according to the playback conditions.
The default settings are underlined.

Select "SCREEN SETUP" in the setup display.



■ TV TYPE
Selects the aspect ratio of the TV to be connected.
- 4:3 LETTER BOX: select this when you connect a normal TV to the player. Displays a wide picture with bands on the upper and lower portions of the screen.
- 4:3 PAN SCAN: select this when you connect a normal TV to the player. Displays the wide picture on the whole screen automatically and cuts off the portions that do not fit.
- 16:9/4:3 WIDE MODE: select this when you connect a wide-screen TV to the player or when you connect a TV with the WIDE MODE function to the player (displays a wide picture with bands displayed on the upper and lower portions of the screen).

4:3 LETTER BOX

4:3 PAN SCAN

16:9

4:3 WIDE MODE

Note
Depending on the DVD, "4:3 LETTER BOX" may be selected automatically instead of "4:3 PAN SCAN" and vice versa.

■ SCREEN SAVER
Turns on and off the screen saver. If you turn on the screen saver, the screen saver image appears when you leave the player or the remote in pause or stop mode for 15 minutes, or when you play back a CD for more than 15 minutes. The screen saver will help prevent your display device from becoming damaged.
- ON: turns on the screen saver.
- OFF: turns off the screen saver.

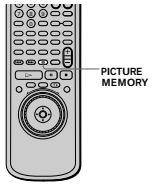
■ BACKGROUND
Selects the background color or picture on the TV screen in stop mode or while playing a CD.
- JACKET PICTURE: The jacket picture appears in the background, but only when the jacket picture is already recorded on the disc.
- PICTURE MEMORY: Your favorite picture appears in the background. For an explanation of how to store your favorite scene recorded on the disc for the background picture, see the following section "Storing a picture in memory."
- GRAPHICS: A preset picture stored in the player appears in the background.
- BLUE: The background color is blue.
- BLACK: The background color is black.

Note
If a disc which does not contain the jacket picture is played while "BACKGROUND" is set to "JACKET PICTURE," the picture stored in the player will automatically appear in the background.

■ STARTUP SCREEN
Selects the startup screen. The startup screen image you selected appears when you turn on the player.
- STANDARD: The standard startup screen in the player's memory appears.
- PICTURE MEMORY: Your favorite picture appears in the startup screen. For an explanation of how to store your favorite scene recorded on the disc for the startup screen, see the following section "Storing a picture in memory."
  If you select PICTURE MEMORY before setting a picture in memory, the standard startup screen will appear.

Storing a picture in memory

During playback, when you find the scene to be stored in memory, press PICTURE MEMORY on the remote.
The picture is stored in memory.

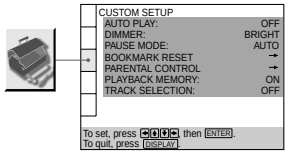


Notes
- The player can store only one scene in memory. The stored picture appears in both the background and the startup screen.
- Depending on the DVD, some scenes cannot be stored in memory when using the remote.
- When the picture is stored in memory by pressing PICTURE MEMORY, the picture stored before is erased.
- If you operate this player while the picture is being stored in memory, the player will fail to store the picture.

Custom Settings (CUSTOM SETUP)
DVD VIDEO CD CD

"CUSTOM SETUP" allows you to set the playback conditions.
The default settings are underlined.

Select "CUSTOM SETUP" in the setup display.



■ AUTO PLAY
Selects the Auto Play setting when you connect the AC power cord to the AC outlet.
- OFF: does not use "TIMER," "DEMO1" or "DEMO2" to start playback.
- TIMER: starts playing when the player is turned on, or at any time you want when connected to a timer (not supplied). Set the timer when the player is in standby mode (the power indicator lights up in red).
- DEMO1: starts playing the first demonstration automatically.
- DEMO2: starts playing the second demonstration automatically.

■ DIMMER
Adjusts the lighting of the front panel display.
- BRIGHT: makes the front panel display bright.
- DARK: makes the front panel display dark.
- OFF: turns off the lighting of the front panel display.

■ PAUSE MODE (DVD only)
Selects the picture in pause mode.
- AUTO: A picture, including subjects that move dynamically, is output with no jitter. Normally select this position.
- FRAME: A picture including subjects that do not move dynamically is output with high resolution.

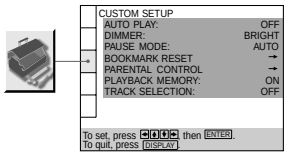
■ BOOKMARK RESET→
Select "BOOKMARK RESET." The BOOKMARK reset display appears. And then press ENTER to reset all bookmarks.

■ PARENTAL CONTROL→
Sets a password and playback limitation level for DVDs with playback limitation for children.
The same password is used for both Parental Control and Custom Parental Control (page 43) .
For details, see "Limiting Playback by Children (Parental Control) ."

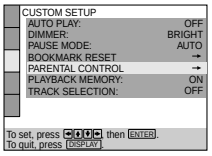
Limiting Playback by Children (Parental Control) DVD

Playback of some DVDs can be limited depending on the age of the users. The "Parental Control" function allows you to set a playback limitation level.

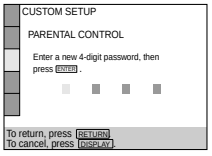
Select "CUSTOM SETUP" in the setup display.



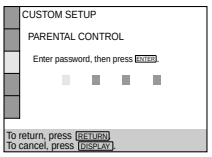
1 Select "PARENTAL CONTROL" using ↑/↓, then press ENTER.



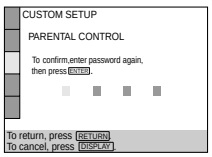
■ When you have not entered a password
The display for entering a password appears.


CUSTOM SETUP
PARENTAL CONTROL
Enter a new 4-digit password, then press ENTER .
To return, press RETURN.
To cancel, press DISPLAY.

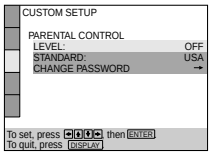
■ When you have already registered a password
The display for confirming the password appears. Skip Step 2.



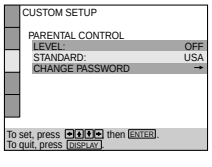
2 Enter a password in 4 digits using the number buttons, then press ENTER.
The digits change to asterisks (✱), and the display for confirming the password appears.



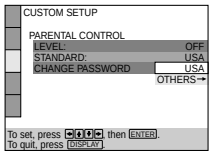
3 To confirm your password, enter it again using the number buttons, then press ENTER.
The display for setting the playback limitation level and changing the password appears.



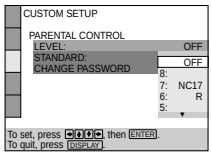
4 Select "STANDARD" using ↑/↓, then press →.



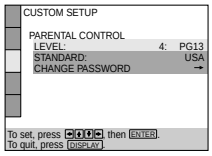
5 Select a geographic area as the playback limitation level standard using ↑/↓, then press →.
When you select "OTHERS→," select and enter the standard code in the table on the next page using the number buttons.



6 Select "LEVEL" using ↑/↓, then press →.



7 Select the level you want using ↑/↓, then press ENTER.



The lower the value, the more strict the limitation.

To return to the normal screen
Press DISPLAY.

To turn off the Parental Control function and play the DVD after entering your password
Set "LEVEL" to "OFF" in Step 7, then press ▷.

To change the password

1 After Step 3, select "CHANGE PASSWORD" using ↑/↓, then press → or ENTER.
The display for changing the password appears.
2 Follow Steps 2 and 3 to enter a new password.

Playing a disc which is blocked by the playback limitation level

1 Insert the disc and press ▷.
The PARENTAL CONTROL display appears.
2 Enter your 4-digit password using the number buttons, then press ENTER.
The player starts playback.
When you stop playing the DVD, the level returns to the original level.

If you forget your password
Enter the 6-digit number "199703" whenever the PARENTAL CONTROL display asks you for your password, then press ENTER. The display will ask you to enter a new 4-digit password.

Notes
- When you play DVDs which do not have the Parental Control function, playback cannot be limited on this player.
- If you do not set a password, you cannot change the settings for playback limitation.
- Depending on the DVD, you may be asked to change the parental control level while playing the disc. In this case, enter your password, then change the level.
When you stop playing the DVD, the level returns to the original level.
- The same password is used for both Parental Control and Custom Parental Control (page 43).

Standard	Code number
Argentina	2044
Australia	2047
Austria	2046
Belgium	2057
Brazil	2070
Canada	2079
Chile	2090
China	2092
Denmark	2115
Finland	2165
France	2174
Germany	2109
Hong Kong	2219
India	2248
Indonesia	2238
Italy	2254
Japan	2276
Korea	2304
Malaysia	2363
Mexico	2362
Netherlands	2376
New Zealand	2390
Norway	2379
Pakistan	2427
Philippines	2424
Portugal	2436
Russia	2489
Singapore	2501
Spain	2149
Sweden	2499
Switzerland	2086
Taiwan	2543
Thailand	2528
United Kingdom	2184

■ PLAYBACK MEMORY
The player can store the SUBTITLE, VIDEO EQUALIZER, and other settings of each disc for up to 300 discs (Playback Memory).
Set the Playback Memory function on or off.
- ON : stores the settings in memory when you eject the disc.
- OFF : does not store the settings in memory.

The following settings are stored in memory by the Playback Memory function.
– AUDIO (page 35)*
– SUBTITLE (page 37)*
– ANGLE (page 38)*
– VIRTUAL 3D SURROUND (page 39)
– VIDEO EQUALIZER (page 51)
– DIGITAL VIDEO ENHANCER (page 52)
* DVD only

Notes
- The player can store the settings of up to 300 discs. When you store the setting of disc number 301, the first disc setting is canceled.
- Depending on the DVD, the information stored in the disc takes priority over the Playback Memory settings and the function does not work.
- Do not turn off the player by pressing ⏻. Doing so may cancel the settings. When you turn off the player, press ■ first to stop playback and then press I/⏻ on the remote. After the power indicator lights up in red and the player enters standby mode, press ⏻ on the player.

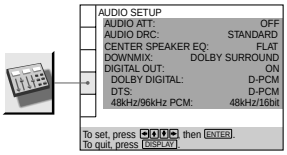
■ TRACK SELECTION
Gives the sound track which contains the highest number of channels priority when you play a DVD on which multiple audio formats (PCM, DTS or Dolby Digital format) are recorded.
- OFF : No priority given.
- AUTO : Priority given.

Notes
- When you set this item to "AUTO," the language may change depending on the "AUDIO" settings in "LANGUAGE SETUP." The "TRACK SELECTION" setting has higher priority than the "AUDIO" settings in "LANGUAGE SETUP" (page 59).
- If you set "DTS" in "AUDIO SETUP" to "D-PCM", the DTS sound track is not played even if you set this item to "AUTO" and the highest-numbered audio channel is recorded in DTS format.
- If PCM, DTS and Dolby Digital sound tracks have the same number of channels, the player selects PCM, DTS and Dolby Digital sound tracks in this order.
- Depending on the DVD, the audio channel with priority may be predetermined. In this case, you cannot give priority to the DTS or Dolby Digital format by selecting "AUTO."

Settings for the Sound (AUDIO SETUP)

"AUDIO SETUP" allows you to set the sound according to the playback conditions.
The default settings are underlined.

Select "AUDIO SETUP" in the setup display.



■ AUDIO ATT (attenuation)
If the playback sound is distorted, set this item to "ON." The player reduces the audio output level.
Selects the setting of the output from the AUDIO OUT (1, 2) connectors according to the audio equipment to be connected.
- OFF: turns off the audio attenuation. Normally select this position.
- ON: reduces the audio output level so that no sound distortion occurs. Select this when the playback sound from the built-in TV speakers is distorted.

Note
The setting does not affect the output from the DIGITAL OUT OPTICAL and COAXIAL connectors.

■ AUDIO DRC (Dynamic Range Control) (DVD only)
Makes the sound clear when the volume is turned down when playing a DVD. This function works only when you play a DVD which has the AUDIO DRC function. This affects the output from the DIGITAL OUT connectors only when "DOLBY DIGITAL" is set to "D-PCM" and "DTS" to "D-PCM" in "DIGITAL OUT."
- STANDARD: Normally select this position.
- TV MODE: makes the low sounds clear even if you turn the volume down. It is especially recommended when you listen to the sound using the speakers of the TV.
- WIDE RANGE: It gives you the feeling of being at a live performance. This function only works when you are playing a Dolby Digital disc and is more effective when you connect 6 speakers using the 5.1 channel connectors. When you use high quality speakers, it is even more effective.

Note
When you play DVDs without the AUDIO DRC function, there may be no effect on the sound.

■ CENTER SPEAKER EQ (equalizer)
Makes the spoken track clear by changing the frequency response when speech is difficult to hear. A center speaker must be connected to the CENTER connector of 5.1CH OUTPUT for this function to work.
- FLAT: outputs the spoken track as it was recorded.
- ENHANCED: enhances the spoken track only.
- SOFT: makes the sound softer by rounding out the sound frequency above 8 kHz. Select this when the spoken track sounds shrill.

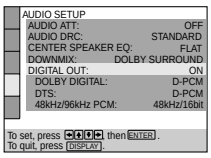
■ DOWNMIX
Switches the mixing down methods when you play a DVD on which rear signal components such as LS, RS, or S are recorded in Dolby Digital or DTS format. For details on the rear signal components, see "Displaying the audio information of the disc" (page 36).
This affects the output from the DIGITAL OUT connectors only when "DOLBY DIGITAL" is set to "D-PCM" and "DTS" to "D-PCM" in "DIGITAL OUT."
- DOLBY SURROUND: when the player is connected to an audio component that conforms to Dolby Surround (Pro Logic). The output signals which reproduce the Dolby Surround (Pro Logic) effect are mixed down to 2 channels.
- NORMAL: when the player is connected to an audio component that does not conform to Dolby Surround (Pro Logic). The signals without the Dolby Surround (Pro Logic) effect are output.

■ DIGITAL OUT
Selects output signals via the DIGITAL OUT OPTICAL and COAXIAL connectors.
- ON: Normally select this position. When you select "ON," set "DOLBY DIGITAL," "DTS" and "48kHz/96kHz PCM." For details on setting these items, see "Setting the Digital Output Signal."
- OFF: when the player does not output the sound signals via the DIGITAL OUT OPTICAL and COAXIAL connectors, the influence of the digital circuit upon the analog circuit is at a minimum.

Note
When you select "OFF," you cannot set "DOLBY DIGITAL," "DTS" and "48kHz/96kHz PCM."

Setting the Digital Output Signal

Switches the methods of outputting audio signals when you, connect 1. a digital component such as a receiver (amplifier) having a digital connector, 2. an audio component having a built-in decoder (Dolby Digital or DTS), 3. a DAT or MD via the DIGITAL OUT OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord. For connection details, see page 11.
You cannot adjust "DOLBY DIGITAL," "DTS" and "48kHz/96kHz PCM" if you set "DIGITAL OUT" to "OFF."



■ DOLBY DIGITAL
Selects the Dolby Digital signals to be output via the DIGITAL OUT OPTICAL and COAXIAL connectors.
- D-PCM (Downmix PCM): when the player is connected to an audio component lacking a built-in Dolby Digital decoder. If you play Dolby Digital sound tracks, the output audio signals are mixed down to 2 channels. You can select whether the signals conform to Dolby Surround (Pro Logic) or not by making adjustments to the "DOWNMIX" item in "AUDIO SETUP."
- DOLBY DIGITAL: when the player is connected to an audio component with a built-in Dolby Digital decoder. If the player is connected to an audio component lacking a built-in Dolby Digital decoder, do not set this. Otherwise, when you play the Dolby Digital sound track, a loud noise (or no sound) will come out from the speakers, affecting your ears or causing the speakers to be damaged.

■ DTS
Selects the DTS signals to be output via the DIGITAL OUT OPTICAL and COAXIAL connectors.
- D-PCM: when the player is connected to an audio component lacking a built-in DTS decoder. If you play DTS sound tracks, the player outputs stereo signals via the DIGITAL OUT OPTICAL and COAXIAL connectors.
- DTS: when the player is connected to an audio component having a built-in DTS decoder.
If the player is connected to an audio component lacking a built-in DTS decoder, do not set this. Otherwise, when you play the DTS sound track, a loud noise (or no sound) will come out from the speakers, affecting your ears or causing the speakers to be damaged.

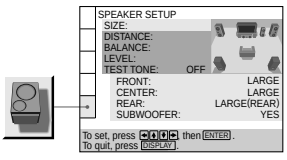
■ 48kHz/96kHz PCM (DVD only)
Selects the sampling frequency of the audio signal to be output via the DIGITAL OUT OPTICAL and COAXIAL connectors.
- 48kHz/16bit: The audio signals of DVDs are always converted to 48 kHz/16 bit.
- 96kHz/24bit: All types of signals including 96 kHz/24 bit are output in their original format. However, if the signal is encrypted for copyright protection purposes, the signal is only output as 48 kHz/16 bit.

Notes
- If you select "96kHz/24bit" when a receiver (amplifier) which cannot accept 96 kHz is connected to the player, no sound or a loud noise will come out from the speakers.
- Even if you set "48kHz/96kHz PCM" in "AUDIO SETUP" to "96kHz/24bit," the sampling frequency is converted to 48 kHz/16 bit when a VIRTUAL 3D SURROUND mode is selected.
- The analog audio signals from the AUDIO OUT connectors are not affected by this setting and keep their original sampling frequency level.

Settings for the Speakers (SPEAKER SETUP)

To obtain the best possible surround sound when you use the 5.1CH OUTPUT connectors, use the SPEAKER SETUP display to first specify the size of the speakers you have connected and their distance from your listening position. Then set the balance and level. Use the test tone to adjust the volume of the speakers to the same level.
For speaker hookup instructions, see page 12.
The default settings are underlined.

Select "SPEAKER SETUP" in the setup display.



■ SIZE
Selects the size of the speakers to be connected.
- FRONT
  — LARGE: Normally select this.
  — SMALL: When the sound cracks or the surround sound effects are difficult to hear, select this. This activates the Dolby Digital bass redirection circuitry and outputs the bass frequencies of the speaker from the subwoofer.
- CENTER
  — NONE: If you do not connect a center speaker, select this.
  — LARGE: Normally select this.
  — SMALL: When the sound cracks, select this. This activates the Dolby Digital bass redirection circuitry and outputs the bass frequencies of the center speaker from other speakers .
- REAR
  — NONE: If you do not connect rear speakers, select this.
  — LARGE (REAR/SIDE): Normally select either of these according to the rear speaker's position*.
  — SMALL (REAR/SIDE): When the sound cracks or the surround sound effects are difficult to hear, select either of these according to the rear speaker's position*. This activates the Dolby Digital bass redirection circuitry and outputs the bass frequencies of the rear speaker from other speakers .

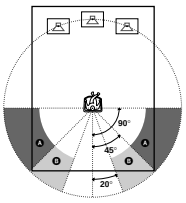
- SUBWOOFER
  — NONE: If you do not connect a subwoofer, select this. This activates the Dolby Digital bass redirection circuitry and outputs the LFE signals from the front speakers as long as the front speaker size is set to "LARGE."
  — YES: If you connect a subwoofer, select this to output the LFE (low frequency effect) channel from the subwoofer.

*** Rear speaker position**

Specify the location of the rear speakers for correct "VIRTUAL REAR SHIFT," "VIRTUAL MULTI REAR" and "VIRTUAL MULTI DIMENSION" effects. These effects can be found in "VIRTUAL 3D SURROUND" of the Control Menu display.

- SIDE: If the location of the rear speakers corresponds to section Ⓐ in the illustration below.
- REAR: If the location of the rear speakers corresponds to section Ⓑ in the illustration below.

This setting affects only the "VIRTUAL REAR SHIFT," "VIRTUAL MULTI REAR" and "VIRTUAL MULTI DIMENSION" mode.

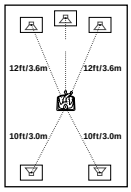


Notes

- The cut off frequency for the subwoofer is fixed at 120 Hz.
- If your speakers are too small to reproduce low bass frequencies, please set all speaker settings to "SMALL" and utilize a subwoofer for low frequency sound.

■ DISTANCE

The default distance setting for the speakers in relation to the listening position is shown below.



You can vary the distance of each speaker as follows. The default adjustments are in parentheses. Be sure to change the value in the setup display when you move the speakers.

- FRONT (12ft/3.6m)
  Front speaker distance can be set in 1 foot (0.3 meter) increments from 4 to 50 feet (1.2 to 15.2 meters). Distance is measured from the front speaker to the listening position.
- CENTER (12ft/3.6m)
  Center speaker distance can be set in 1 foot (0.3 meter) increments. Place the center speaker directly between the front speakers. You can move it up to 2 feet (0.6 meter) backwards or 5 feet (1.5 meters) forwards if necessary.
- REAR (10ft/3.0m)
  Rear speaker distance can be set in 1 foot (0.3 meter) increments. Place the speakers behind the listening position at a distance equal to the front speaker distance. If necessary you can move the rear speakers up to 16 feet (5 meters) closer to your listening position.

To return to the default setting

Select the item, then press CLEAR.

Notes

- If each of the front or rear speakers are not placed at an equal distance from your listening position, set the distance according to the closest speaker.
- Do not place the rear speakers farther away from your listening position than the front speakers.

■ BALANCE

You can vary the balance of the left and right speakers as follows. Be sure to set "TEST TONE" to "ON" for easy adjustment (see ■ TEST TONE below). The default adjustments are in parentheses.

- FRONT (0dB)
  Adjust the balance between the front left and right speakers (–6dB [L] to +6dB [R], 0.5dB increments).
- REAR (0dB)
  Adjust the balance between the rear left and right speakers (–6dB [L] to +6dB [R], 0.5dB increments).

To return to the default setting

Select the item, then press CLEAR.

■ LEVEL

You can vary the level of each speaker as follows. The front speaker level becomes the criterion for adjusting the other speakers. Be sure to set "TEST TONE" to "ON" for easy adjustment (see ■ TEST TONE below). The default adjustments are in parentheses.

- CENTER (0dB)
  Adjust the level of the center speaker (–6dB to +6dB, 0.5dB increments).
- REAR (0dB)
  Adjust the level of the rear speakers (–6dB to +6dB, 0.5dB increments).
- SUBWOOFER (0dB)
  Adjust the level of the subwoofer (–10dB to +10dB, 0.5dB increments).

To return to the default setting

Select the item, then press CLEAR.

■ TEST TONE

The speakers will emit a test tone. Use this when you use the 5.1CH OUTPUT connectors and adjust the BALANCE and LEVEL.

- OFF: The test tone is not emitted from the speakers.
- ON: The test tone is emitted from each speaker in sequence. When you select one of the "SPEAKER SETUP" items, the test tone is emitted from both left and right speakers simultaneously.

Note

When you adjust the speaker settings, the sound cuts off for a moment.

Adjusting the speaker volume

1 After you stop playback, select "SPEAKER SETUP" in the setup display.

2 Select "TEST TONE" and set "TEST TONE" to "ON."
You will hear the test tone from each speaker in sequence.

3 From your listening position, select "BALANCE" or "LEVEL" and adjust the value of "BALANCE" using ←/→ and "LEVEL" using ↑/↓.
The test tone is emitted from both left and right speakers simultaneously.

4 Select "TEST TONE" and set "TEST TONE" to "OFF" to turn off the test tone.

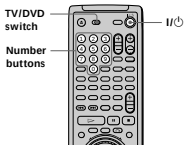
To adjust the volume of all the speakers at one time

Use the receiver's (amplifier's) volume control.

Controlling Your TV or AV Receiver (Amplifier) with the Supplied Remote

By adjusting the remote signal, you can control your TV or AV receiver (amplifier) with the supplied remote.

Controlling TVs with the remote



1 Slide the TV/DVD switch to TV.

2 Hold down I/⏻, and enter your TV's manufacturer's code (see the table) using the number buttons.

3 Release I/⏻.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

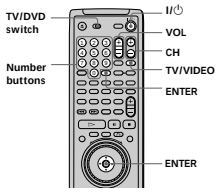
Manufacturer	Code number
Sony (default)	01
Akai	04
AOC	04
Centurion	12
Coronado	03
Curis-Mathes	12
Daytron	12
Emerson	03,04,14
Fisher	11
General Electric	06, 10
Gold Star	03,04,17
Hitachi	02,03
J.C.Penney	04,12
JVC	09
KMC	03
Magnavox	03,08,12
Marantz	04,13
MGA/Mitsubishi	04,12,13,17
NEC	04, 12
Panasonic	06,19
Philco	03,04
Philips	08
Pioneer	16
Portland	03
Quasar	06,18
Radio Shack	05,14
RCA	04,10
Sampo	12
Sanyo	11
Scott	12
Sears	07,10,11
Sharp	03,05,18
Sylvania	08,12
Teknika	03,08,14
Toshiba	07
Wards	03,04,12
Yorx	12
Zenith	15

Notes

- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number may be reset to the default setting. Reset the appropriate code number.

Controlling the TV

You can control your TV using the buttons below. When you set the TV/DVD switch to TV, you can also control the number, I/⏻ and ENTER buttons.

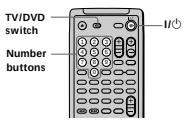


By pressing	You can
I/⏻	Turn the TV on or off
TV/VIDEO	Switch the TV's input source between the TV and other input sources
VOL	Adjust the volume of the TV
CH	Select the channel of the TV
Number buttons and ENTER	Select the channel of the TV

Note

Depending on the TV, you may not be able to control your TV or to use some of the buttons above.

Controlling AV receivers (amplifiers) with the remote



1 Slide the TV/DVD switch to DVD.

2 Hold down I/⏻, and enter your AV receiver's manufacturer's code (see the table) using the number buttons.

3 Release I/⏻.

Code numbers of controllable AV receivers (amplifier)

If more than one code number is listed, try entering them one at a time until you find the one that works with your AV receiver (amplifier).

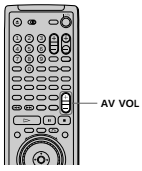
Manufacturer	Code number
Sony	91 (default), 89
Denon	84, 85, 86
Kenwood	92, 93
Onkyo	81, 82, 83
Pioneer	99
Sansui	87
Technics	97, 98
Yamaha	94, 95, 96

Notes

- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number may be reset to the default setting. Reset the appropriate code number.

Controlling the AV receiver (amplifier)

You can change the volume of the AV receiver (amplifier) using AV VOL.



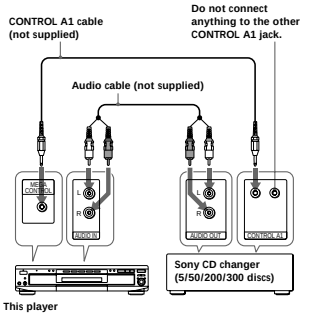
Notes

- Depending on the AV receiver (amplifier), you may not be able to control your AV receiver (amplifier).
- You can control the AV receiver (amplifier) regardless of the position of the TV/DVD switch.

Controlling the CD Changer (Mega Control)

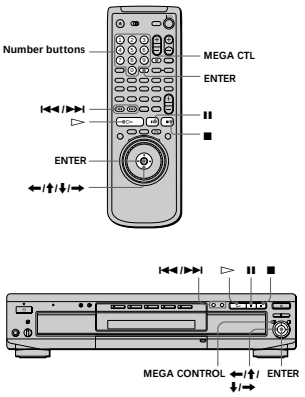
You can control a Sony CD changer of 5/50/200/300 discs connected to the MEGA CONTROL jack of the player.

Connecting the CD changer


CONTROL A1 cable (not supplied)
Do not connect anything to the other CONTROL A1 jack.
Audio cable (not supplied)
MEGA CONTROL
AUDIO OUT
ANALOG IN
Sony CD changer (5/50/200/300 discs)
This player

Controlling the CD changer

The controls indicated below are effective while the MEGA CONTROL button is lit.



1 **Set the command mode selector of the CD changer to "CD 3."**

2 **Turn on the player and the CD changer.**

3 **Press MEGA CONTROL (MEGA CTL).**
The MEGA CONTROL button on the front panel lights up and the display shows the current disc number in the CD changer.

4 **Select the play mode you want on the CD changer.**

5 **Press ▷ on the player to start playing.**
Playback starts and the display shows the current disc and track numbers and the playing time of the track. While the MEGA CONTROL button on the front panel is lit, you can control the CD changer with the controls on the player as follows:

To	Operation
Select a disc in continuous play mode	Press the number button on the remote and ENTER, or ↑/↓ and ENTER.
Skip by 10 discs in continuous play mode	Press ←/→.
Stop	Press ■.
Pause	Press II.
Resume play after pause	Press II or ▷.
Go to the next track	Press ▶▶I.
Go back to the preceding track	Press I◀◀.

To control the player again

Press MEGA CONTROL (MEGA CTL).
The MEGA CONTROL (MEGA CTL) button on the player turns off and you can control the player.

Notes

- Connect only a Sony 5/50/200/300 CD changer to the MEGA CONTROL jack.
- You cannot locate a particular point on a CD's track using the controls on the player.
- Depending on the CD changer, some controls on the player may not operate the CD changer as they do the player.
- You cannot control the player when the MEGA CONTROL button on the front is lit.
- The player will not enter Resume Play after the MEGA CONTROL button on the front has been turned on and off.
- You cannot control the CD changer right after turning on the player or connecting the CD changer. Wait a few seconds until the player recognizes the CDs.
- When the MEGA CONTROL button is lit, you cannot use the Control menu.

Self-diagnosis function

When the self-diagnosis function activates to prevent the player from malfunctioning, a five-character service number (combination of a letter and digits) flashes on the screen and on the front panel display. In this case, check the following table.

First three characters	Cause and/or Corrective Action
C13	• The disc is dirty. ➡ Clean the disc with a cleaning cloth. (page 6)
C31	• The disc is not inserted correctly. ➡ Open the disc tray and insert the disc correctly.
Exx (xx is any number)	• To prevent a malfunction, the player has performed the self-diagnosis function. ➡ When you contact your Sony dealer or local authorized Sony service facility, give the 5-character service number. (example: E:61:10)

Language Code List

For details, see pages 37, 59.

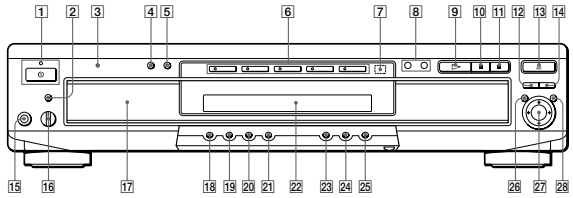
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1186	Scots Gaelic	1350	Malayalam	1513	Siswati
1028	Abkhazian	1194	Galician	1352	Mongolian	1514	Sesotho
1032	Afrikaans	1196	Guarani	1353	Moldavian	1515	Sundanese
1039	Amharic	1203	Gujarati	1356	Marathi	1516	Swedish
1044	Arabic	1209	Hausa	1357	Malay	1517	Swahili
1045	Assamese	1217	Hindi	1358	Maltese	1521	Tamil
1051	Aymara	1226	Croatian	1363	Burmese	1525	Telugu
1052	Azerbaijani	1229	Hungarian	1365	Nauru	1527	Tajik
1053	Bashkir	1233	Armenian	1369	Nepali	1528	Thai
1057	Byelorussian	1235	Interlingua	1376	Dutch	1529	Tigrinya
1059	Bulgarian	1239	Interlingue	1379	Norwegian	1531	Turkmen
1060	Bihari	1245	Inupiak	1393	Occitan	1532	Tagalog
1061	Bislama	1248	Indonesian	1403	(Afan) Oromo	1534	Setswana
1066	Bengali; Bangla	1253	Icelandic	1408	Oriya	1535	Tonga
1067	Tibetan	1254	Italian	1417	Punjabi	1538	Turkish
1070	Breton	1257	Hebrew	1428	Polish	1539	Tsonga
1079	Catalan	1261	Japanese	1435	Pashto; Pushto	1540	Tatar
1093	Corsican	1269	Yiddish	1436	Portuguese	1543	Twi
1097	Czech	1283	Javanese	1463	Quechua	1557	Ukrainian
1103	Welsh	1287	Georgian	1481	Rhaeto-Romance	1564	Urdu
1105	Danish	1297	Kazakh	1482	Kirundi	1572	Uzbek
1109	German	1298	Greenlandic	1483	Romanian	1581	Vietnamese
1130	Bhutani	1299	Cambodian	1489	Russian	1587	Volapük
1142	Greek	1300	Kannada	1491	Kinyarwanda	1613	Wolof
1144	English	1301	Korean	1495	Sanskrit	1632	Xhosa
1145	Esperanto	1305	Kashmiri	1498	Sindhi	1665	Yoruba
1149	Spanish	1307	Kurdish	1501	Sangho	1684	Chinese
1150	Estonian	1311	Kirghiz	1502	Serbo-Croatian	1697	Zulu
1151	Basque	1313	Latin	1503	Singhalese	1703	Not specified
1157	Persian	1326	Lingala	1505	Slovak		
1165	Finnish	1327	Laothian	1506	Slovenian		
1166	Fiji	1332	Lithuanian	1507	Samoan		
1171	Faroese	1334	Latvian; Lettish	1508	Shona		
1174	French	1345	Malagasy	1509	Somali		
1181	Frisian	1347	Maori	1511	Albanian		
1183	Irish	1349	Macedonian	1512	Serbian		

Index to Parts and Controls

Refer to the pages indicated in parentheses for details.

Front Panel



1 ⏻ **(power) button and indicator (16)**
Disconnects the power of the player or places the player in standby mode.

2 **VIRTUAL SURROUND HEADPHONES button and indicator (41)**
Press to turn on the VIRTUAL SURROUND HEADPHONES function.
The indicator lights up when it is on.

3 **MULTICHANNEL indicator**
Lights up when:
– playing back a Dolby Digital soundtrack on the DVD
– playing back a DTS soundtrack on the DVD
– the disc is not inserted

4 **DVE (Digital Video Enhancer) button and indicator (52)**
Press to select a Digital Video Enhancer level.
The indicator lights up for every selected item except "OFF."

5 **VIRTUAL 3D SURROUND button and indicator (41)**
Press to select the desired "VIRTUAL 3D SURROUND" item.
The indicator lights up for every selected item except "OFF."

6 **DISC SELECT 1 – 5 buttons and indicators (18)**
Selects a disc. The indicator lights up in green when a disc is being played or is loaded, and lights up in amber if the disc is waiting to be loaded. The indicator does not light up when the loaded tray is empty or if the disc cannot be played.

7 **(remote sensor) (7)**
Accepts the remote control signals.

8 **I◄◄ /►►I PREV/NEXT (previous/next) buttons (17)**
Press to go to the next chapter or track, or to go back to the previous chapter or track.

9 ▷ **(play) button (16)**
Plays a disc.

10 **II (pause) button (17)**
Pauses playing a disc.

11 **■ (stop) button (17, 19)**
Stops playing a disc.

12 **EXCHANGE button (22)**
Press to change discs during playback.

13 ⏏**OPEN/CLOSE button (16)**
Opens or closes the disc tray.

14 **DISC SKIP button (16, 22)**
Press to turn the disc tray to place other discs.

15 **PHONES connector (16)**
Connect the headphones to this connector.

16 **PHONES LEVEL control (16)**
Adjusts the headphone volume.

17 **Disc tray (16)**
Place the discs on the tray.

18 **SHUFFLE button (48)**
Displays the "SHUFFLE" display on the TV screen.

19 **REPEAT button (49)**
Displays the "REPEAT" display on the TV screen.

20 **1/ALL button (45)**
Selects 1 DISC or ALL DISCS play mode.

21 **LOAD button (25)**
Reads the information of the discs loaded in sequence.

22 **Front Panel Display (23)**
Indicates the playing time, etc.

23 **TITLE button (20)**
Displays the title menu on the TV screen.

24 **DVD MENU button (21)**
Displays the DVD menu on the TV screen.

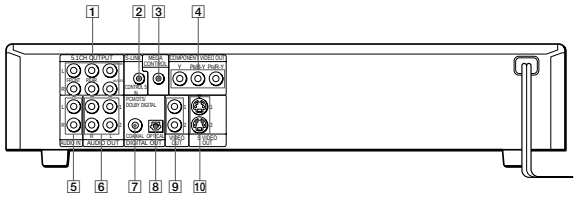
25 **RETURN button (22, 29)**
Press to return to the previously selected screen, etc.

26 **MEGA CONTROL button and indicator (72)**
Press to control the connected CD changer.

27 **←/↑/↓/→/ENTER button**
Selects and executes the items or settings.

28 **DISPLAY button (28)**
Displays the Control Menu display on the TV screen to set or adjust the Control Menu items.

Rear Panel



1 **5.1CH OUTPUT connectors (13)**
Connect to a receiver (amplifier) having 5.1 channel input connectors.

2 **S-LINK connector (8)**
Connect to the S-link connector on an external component.

3 **MEGA CONTROL connector (72)**
Connect to the control connector on a Sony CD changer of 5/50/200/300 discs.

4 **COMPONENT VIDEO OUT connectors (9)**
Connects to a monitor or projector having component video input connectors (Y, PB/B-Y, PR/R-Y) that conform to output signals from the player.

5 **AUDIO IN (L, R) connectors (72)**
Connect to the audio output on a Sony CD changer of 5/50/200/300 discs.

6 **AUDIO OUT R (right)/L (left) 1/2 connectors (8, 10)**
Connect to the audio input connector on your TV or receiver (amplifier).

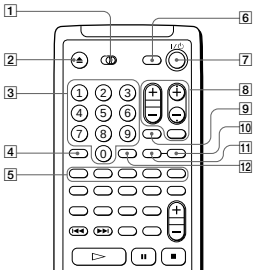
7 **DIGITAL OUT COAXIAL connector (10)**
Connect to an audio component using a coaxial digital connecting cord.

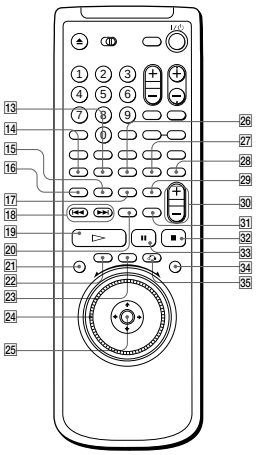
8 **DIGITAL OUT OPTICAL connector (10)**
Connect to an audio component using an optical digital connecting cord. Take off the cap.

9 **VIDEO OUT 1/2 connectors (8)**
Connect to the video input connector on your TV or monitor.

10 **S VIDEO OUT 1/2 connectors (8, 10)**
Connect to the S video input connector on your TV or monitor.

Remote





1 **TV/DVD switch (70)**
Selects to control the player or the TV with the remote.

2 ⏏**OPEN/CLOSE button (17)**
Opens or closes the disc tray.

3 **Number buttons**
Selects the items or settings.

4 **CLEAR button (47 through 50)**
Press to return to continuous play, etc.

5 **DISC 1 – 5 buttons (17)**
Selects a disc.

6 **DISC EXPLORER button (25)**
Displays the disc information such as jacket picture and disc memo.

7 **I/⏻ (on/standby) button (16)**
Press to turn on the player or place it in standby mode after power is connected by pressing ⏻ on the player.

8 **TV (television) operation buttons (71)**
Controls TVs.

9 **MEGA CTL (control) button (72)**
Press to control the connected CD changer.

10 **TIME/TEXT button (23)**
Displays the playing time of the disc, etc., on the front panel display.

11 **INPUT button (35)**
Press when labeling a disc.

12 **ENTER button**
Executes the items or settings.

13 **PROGRAM button (47)**
Displays the "PROGRAM" display on the TV screen.

14 **SHUFFLE button (48)**
Displays the "SHUFFLE" display on the TV screen.

15 **ANGLE button (38)**
Changes the angles when playing a DVD.

16 **AUDIO button (36)**
Changes the sound while playing a DVD or VIDEO CD.

17 **SUBTITLE button (37)**
Changes the subtitles when playing a DVD.

18 **I◄◄ /►►I PREV/NEXT (previous/next) buttons (17)**
Press to go to the next chapter or track, or to go back to the previous chapter or track.

19 ▷**PLAY button (16)**
Plays a disc.

20 **PICTURE MEMORY button (61)**
Press to store a picture in memory.

21 **DISPLAY button (28)**
Displays the Control Menu display on the TV screen to set or adjust the Control Menu items.

22 **TITLE button (20)**
Displays the title menu on the TV screen.

23 **DVD MENU button (21)**
Displays the DVD menu on the TV screen.

24 **Click shuttle (18)**
Changes the playback speed.

25 **←/↑/↓/→/ENTER buttons**
Selects and executes the items or settings.

26 **REPEAT button (49)**
Displays the "REPEAT" display on the TV screen.

27 **1/ALL DISCS button (45)**
Selects 1 DISC or ALL DISCS play mode.

28 **DVE (Digital Video Enhancer) button (52)**
Press to select the Digital Video Enhancer level.

29 **LOAD button (25)**
Reads the information of the discs loaded in sequence.

30 **AV VOL button (71)**
Change the sound volume of the AV receivers (amplifiers).

31 **BOOKMARK button (54)**
Press to set a bookmark.

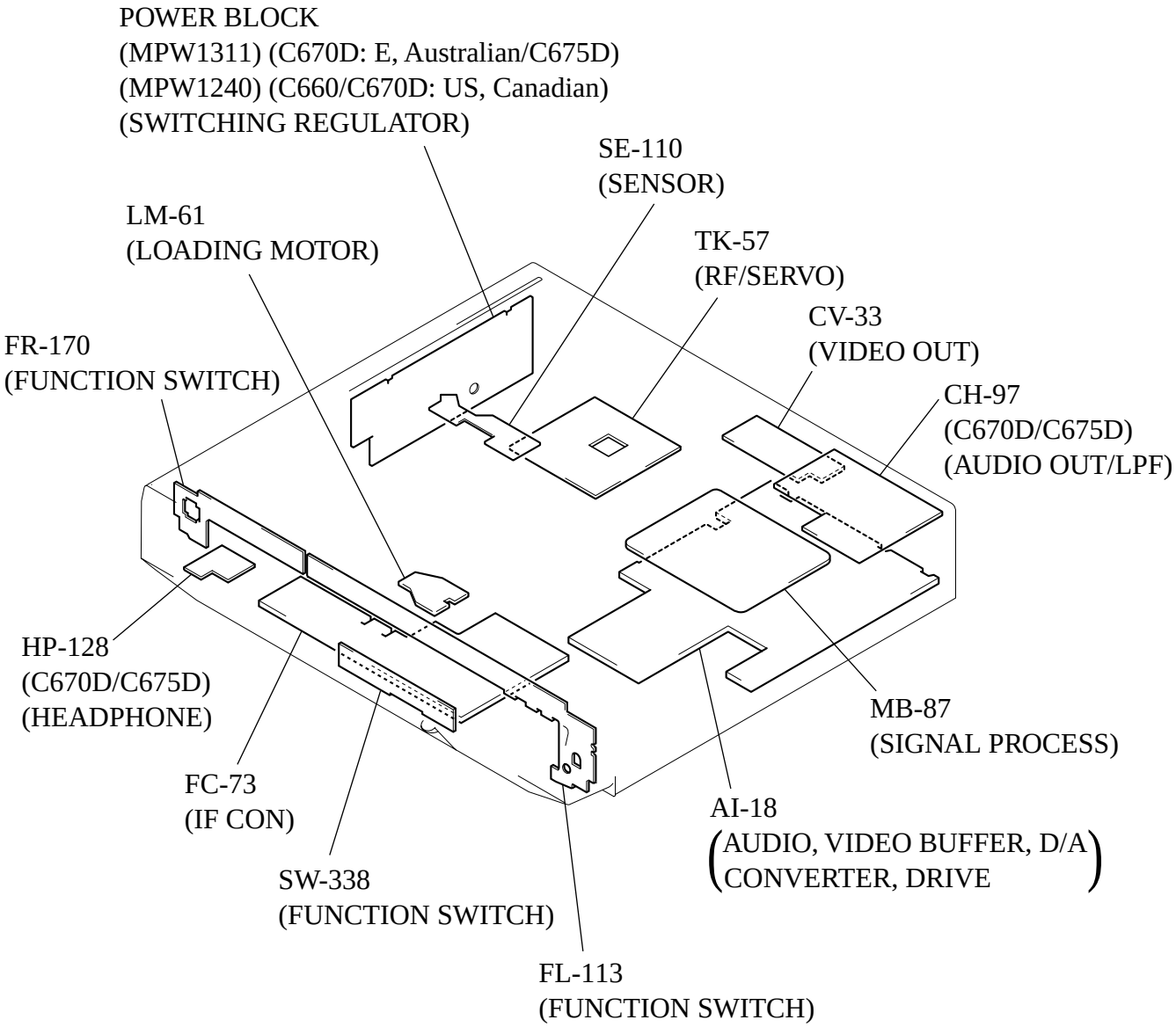
32 **■STOP button (17, 19)**
Stops playing a disc.

33 **IIPAUSE button (17)**
Pauses playing a disc.

34 **JOG button and indicator (18)**
Press to play a disc frame by frame.

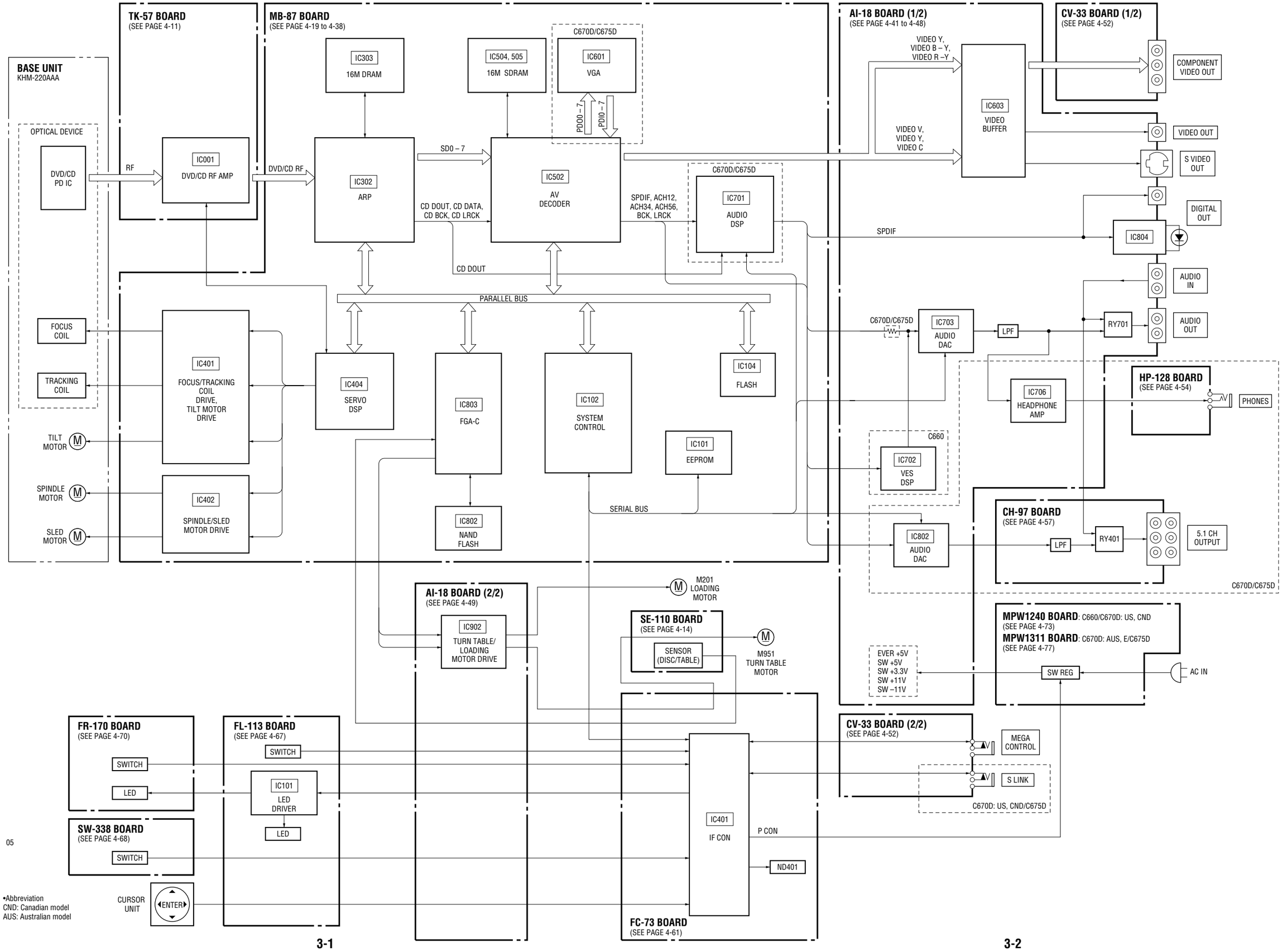
35 **RETURN button (22, 29)**
Press to return to the previously selected screen, etc.

2-16. CIRCUIT BOARDS LOCATION



SECTION 3
BLOCK DIAGRAMS

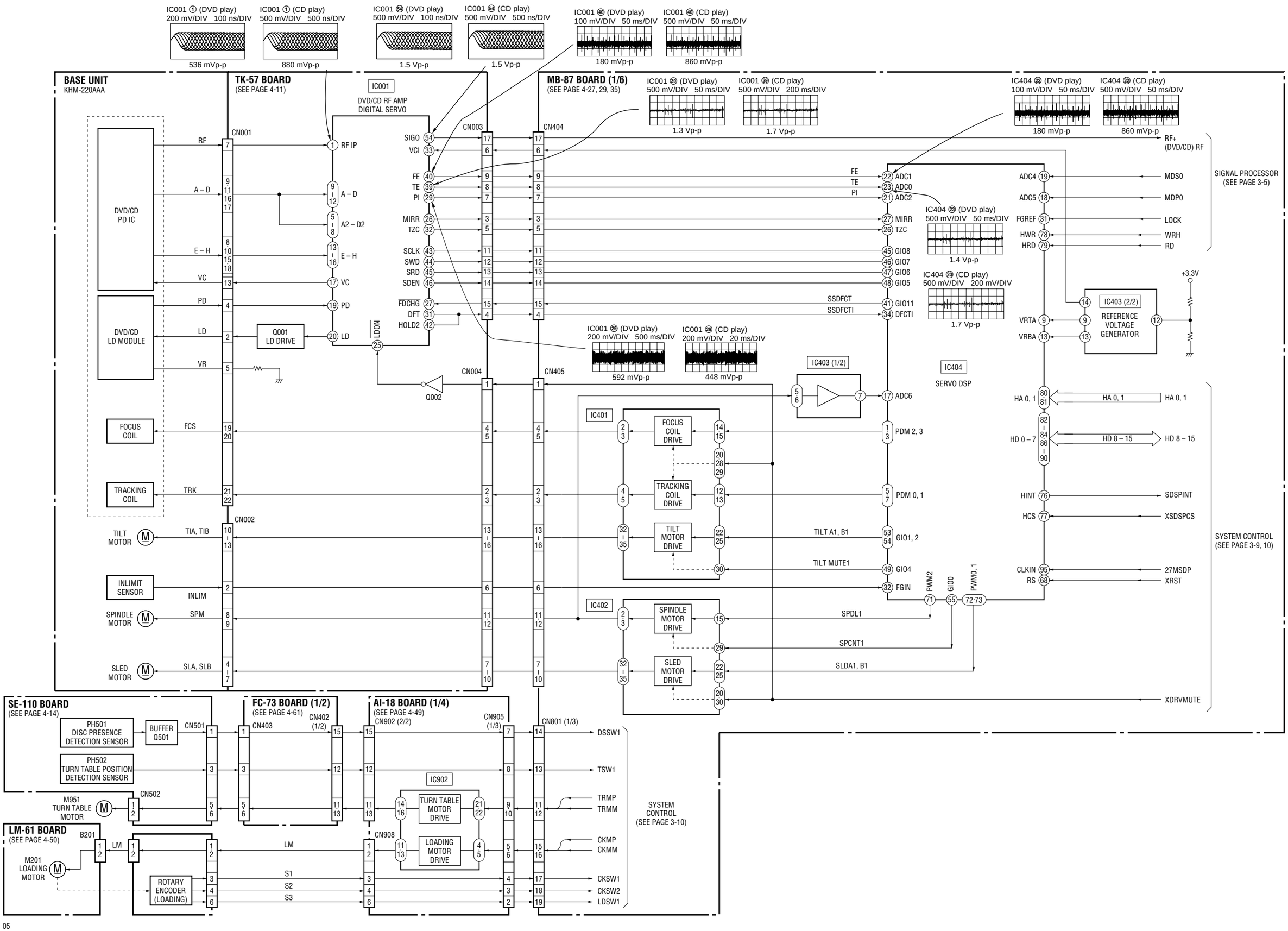
3-1. OVERALL BLOCK DIAGRAM



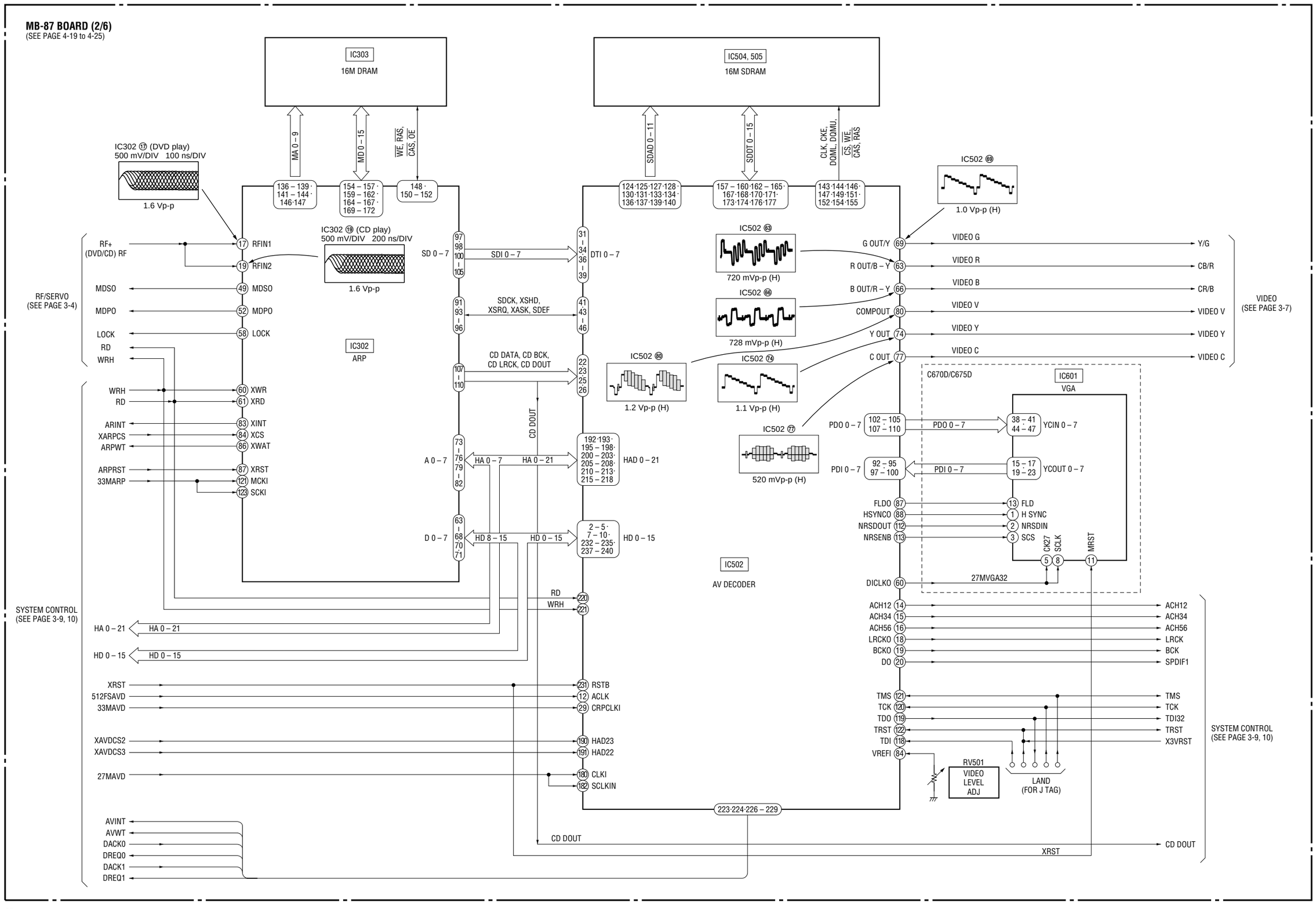
05

•Abbreviation
CND: Canadian model
AUS: Australian model

3-2. RF/SERVO BLOCK DIAGRAM

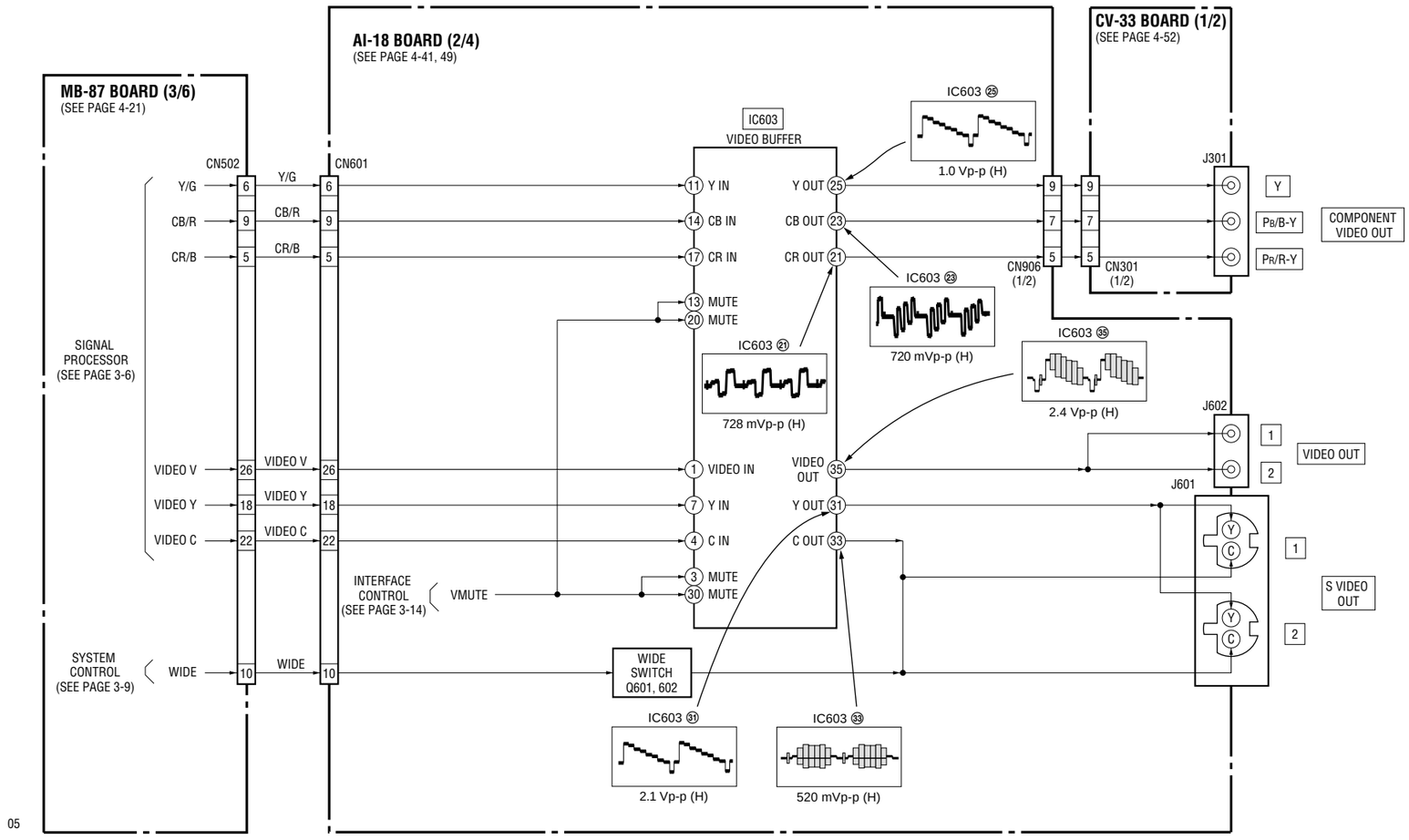


3-3. SIGNAL PROCESS BLOCK DIAGRAM

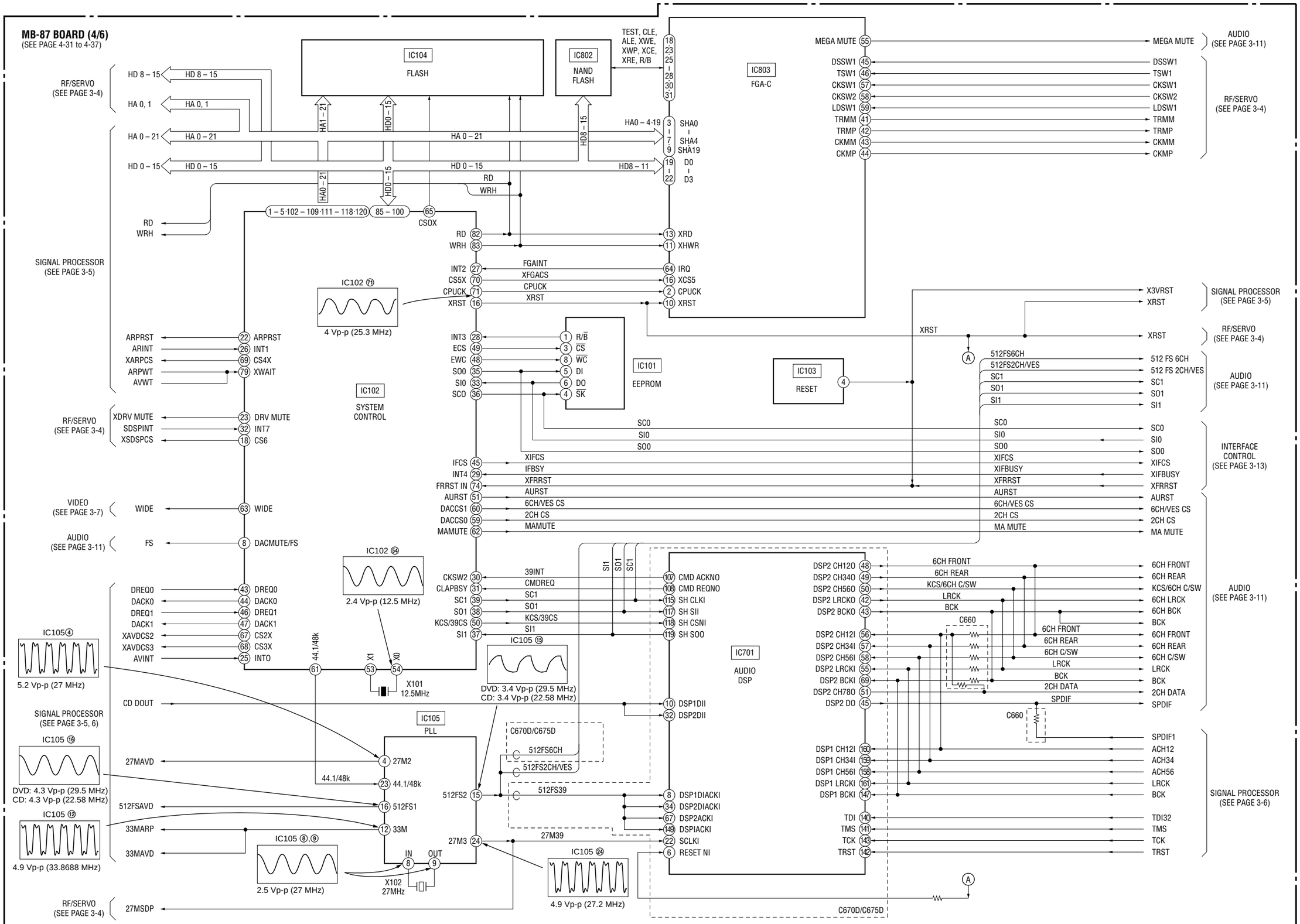


05

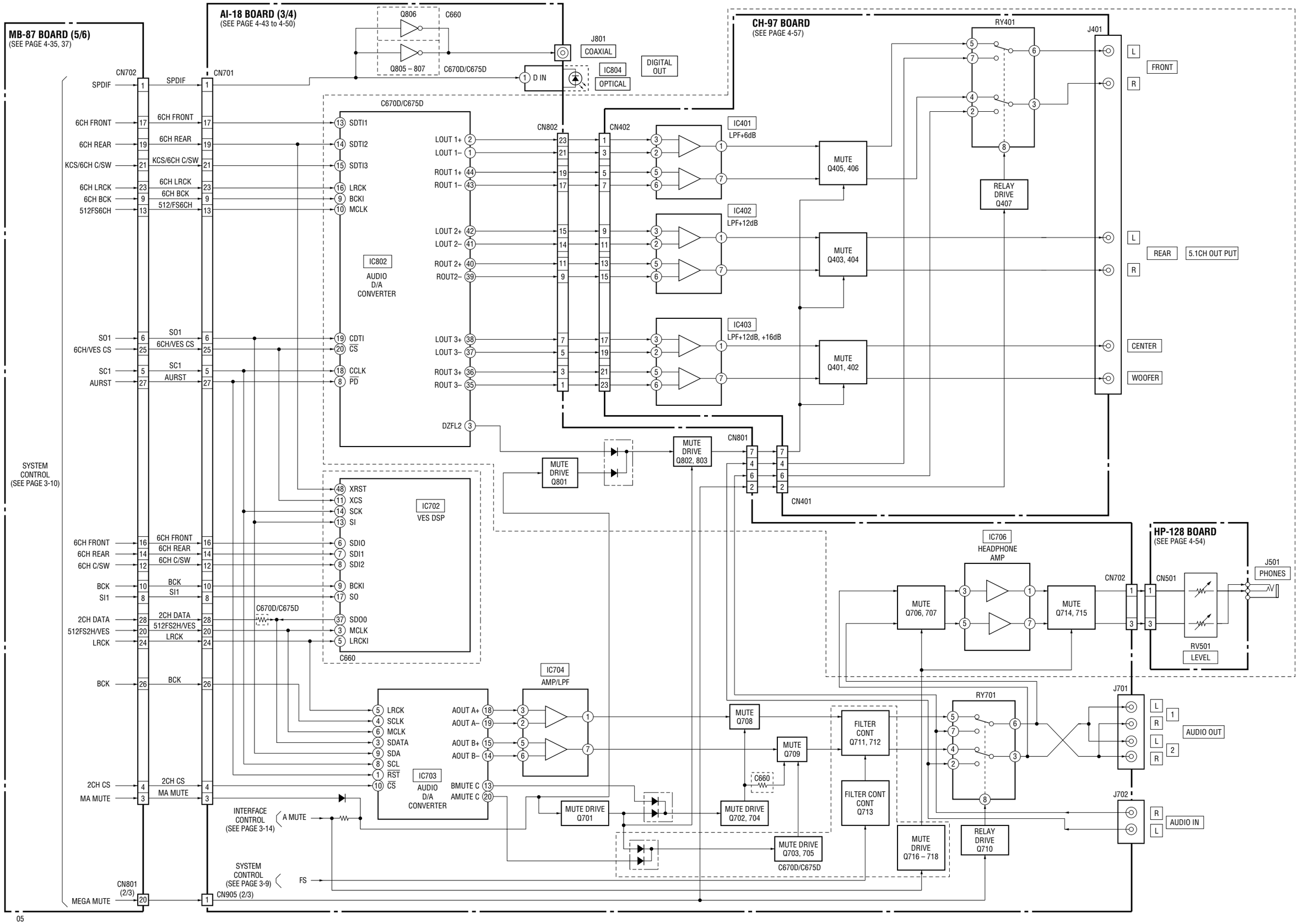
3-4. VIDEO BLOCK DIAGRAM



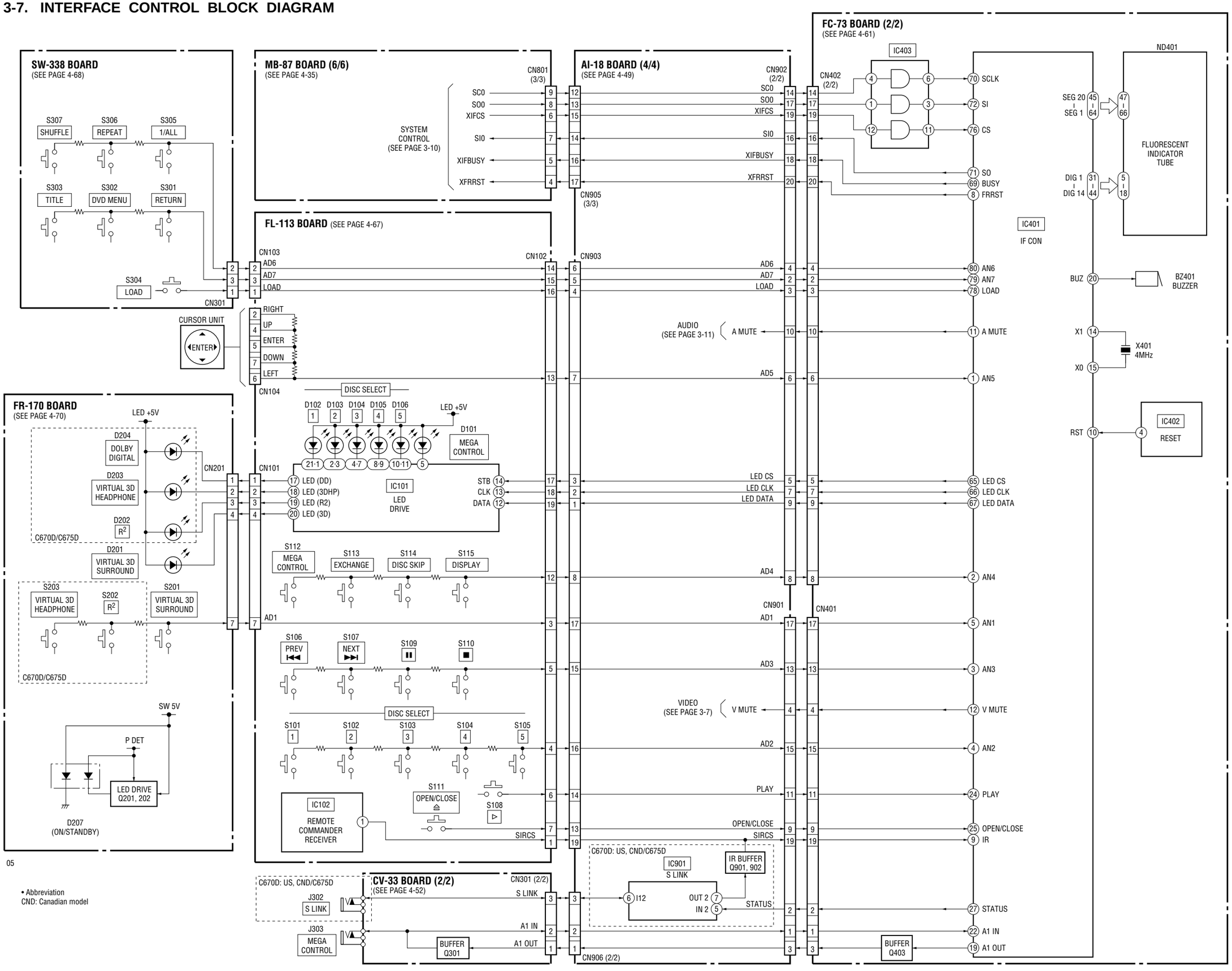
3-5. SYSTEM CONTROL BLOCK DIAGRAM



3-6. AUDIO BLOCK DIAGRAM



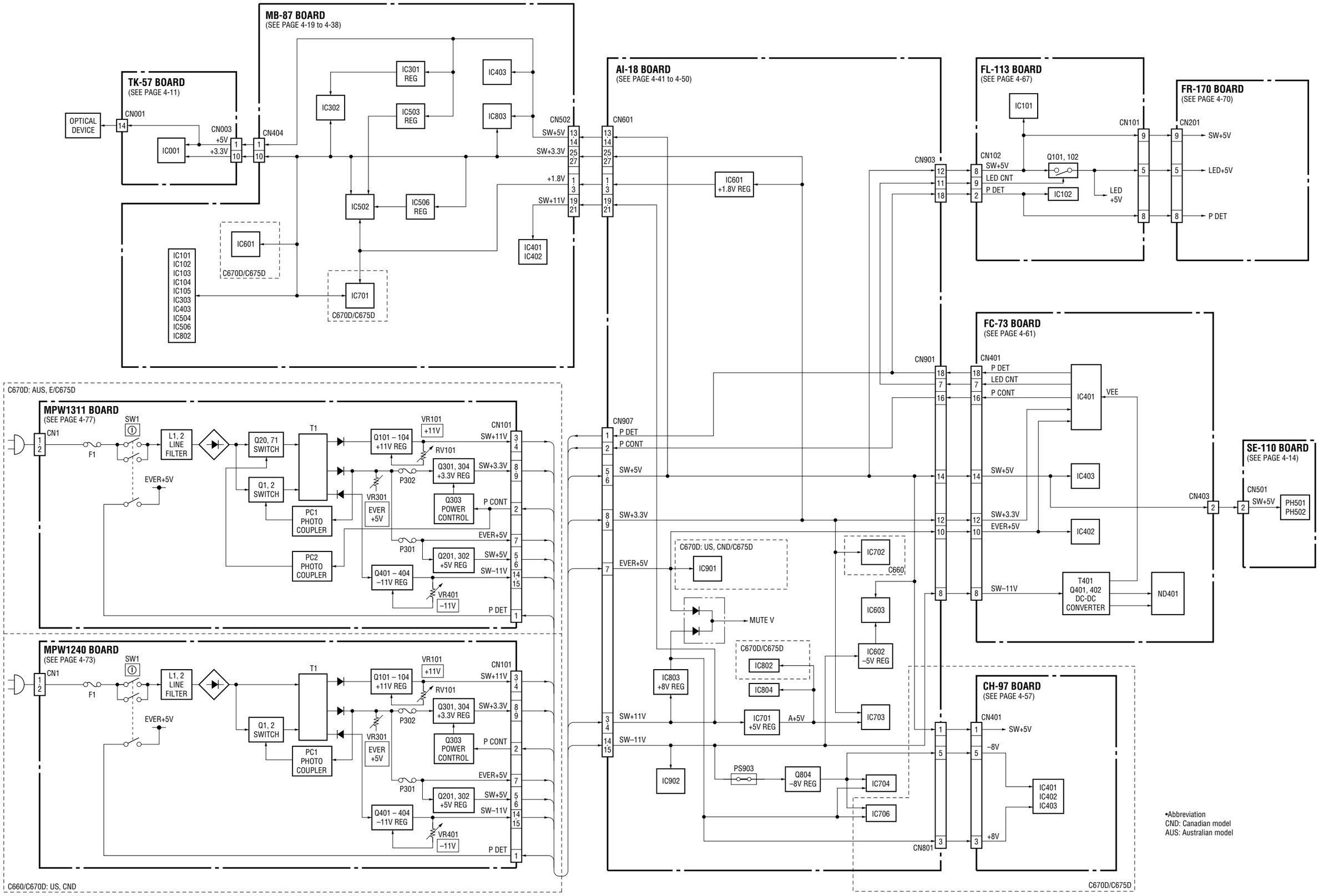
3-7. INTERFACE CONTROL BLOCK DIAGRAM



05

• Abbreviation
CND: Canadian model

3-8. POWER BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- o——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

For schematic Diagram:

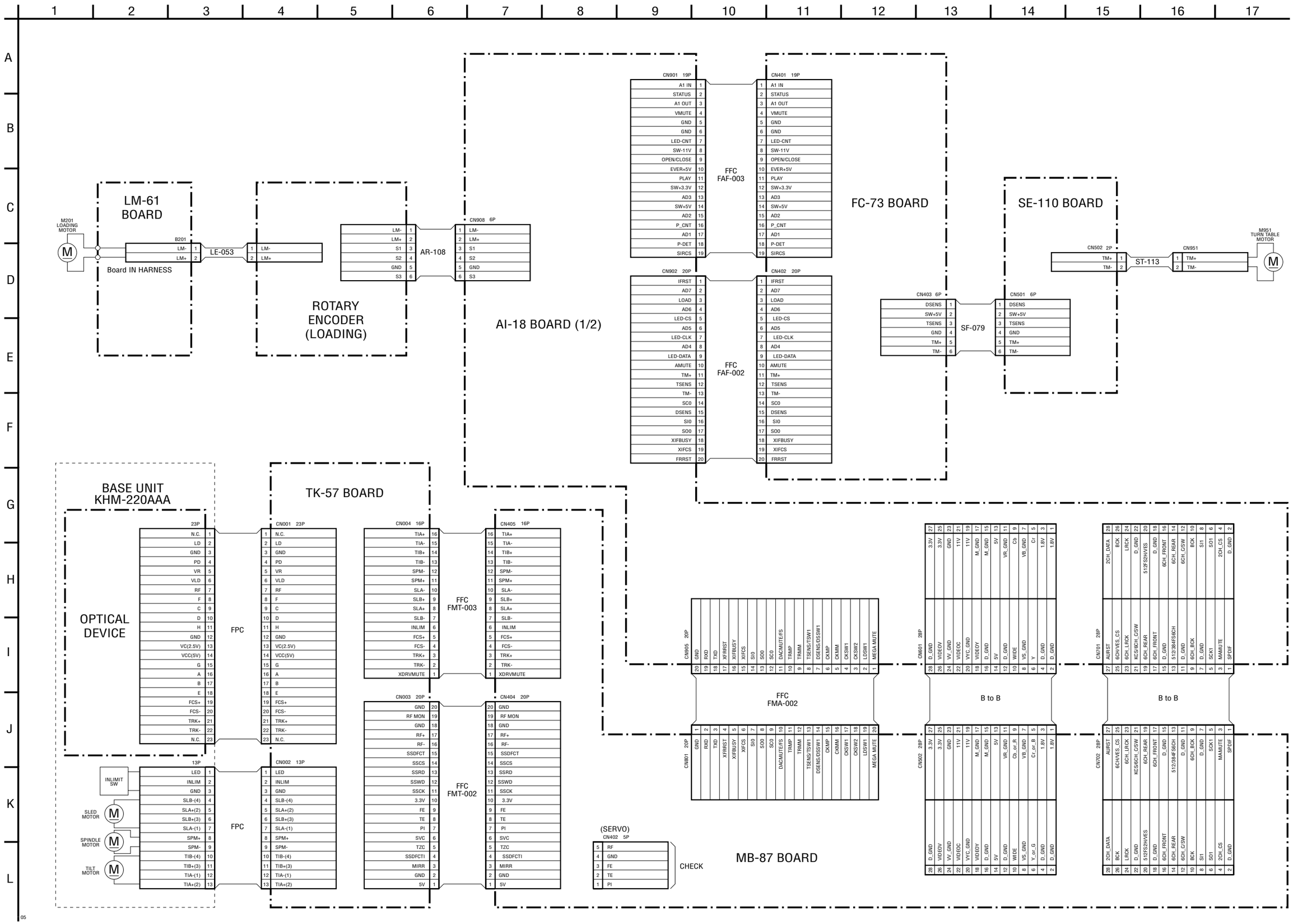
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4 W (Chip resistors : 1/10 W) unless otherwise specified.
  kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- △ : internal component.
- : adjustment for repair.
- B + : B+ Line.
- B − : B– Line.
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD reference disc and when playing CD reference disc.
- Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

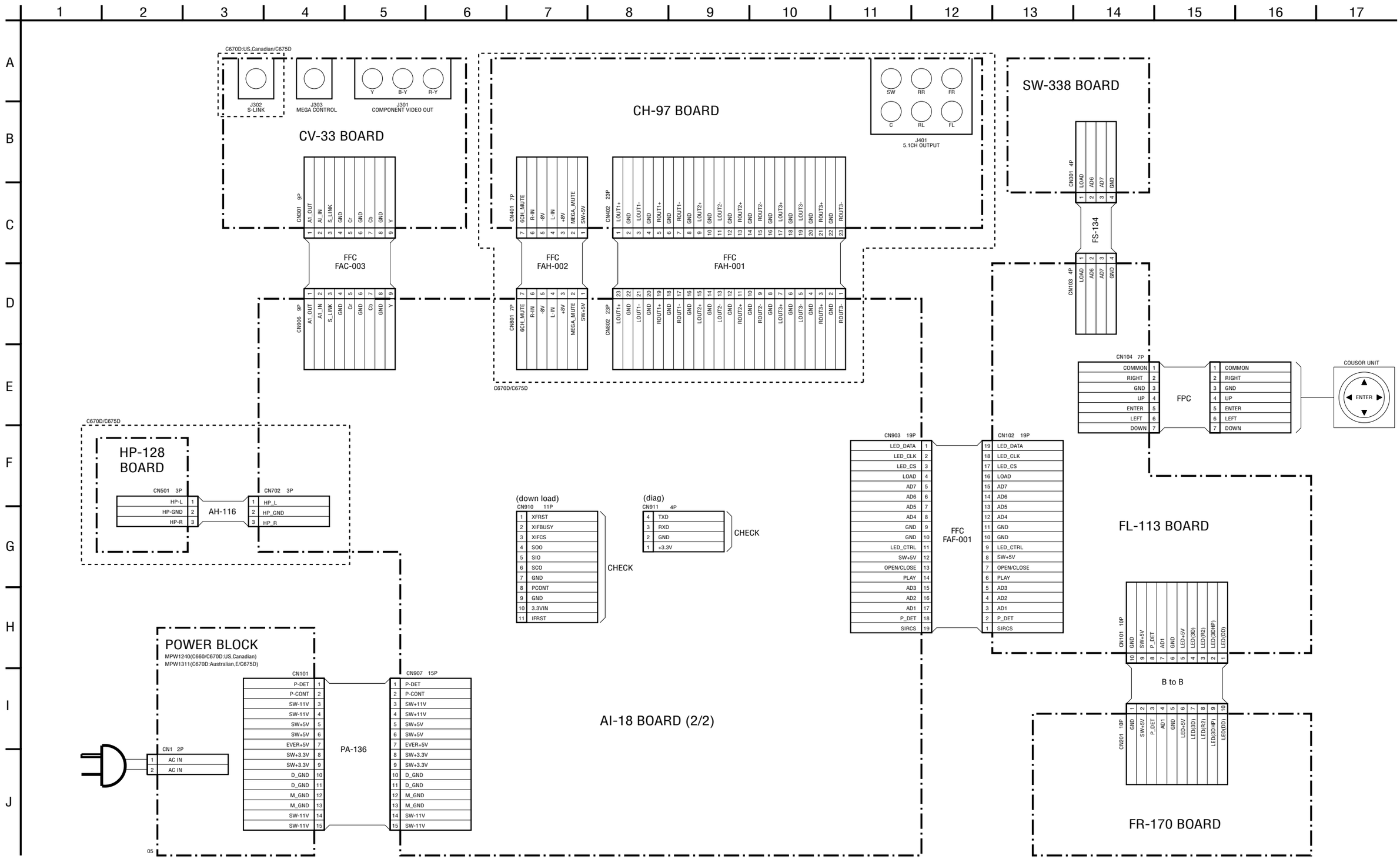
4-1. FRAME SCHEMATIC DIAGRAM

FRAME (1) SCHEMATIC DIAGRAM



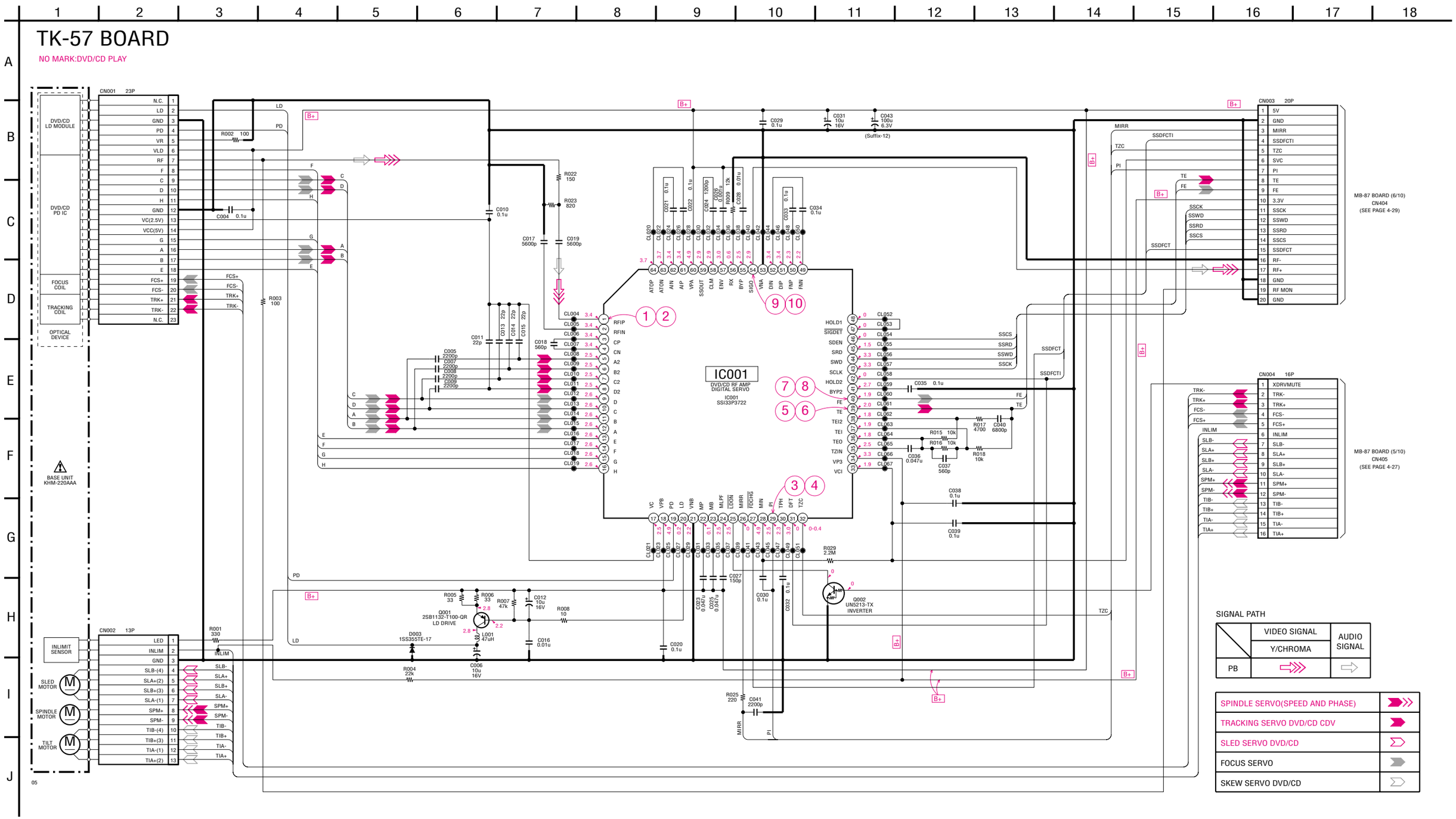
FRAME (1/2)

FRAME (2) SCHEMATIC DIAGRAM



TK-57 (RF/SERVO) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board and page 4-10 for waveforms.

– Ref. No.: TK-57 board; 3,000 series –

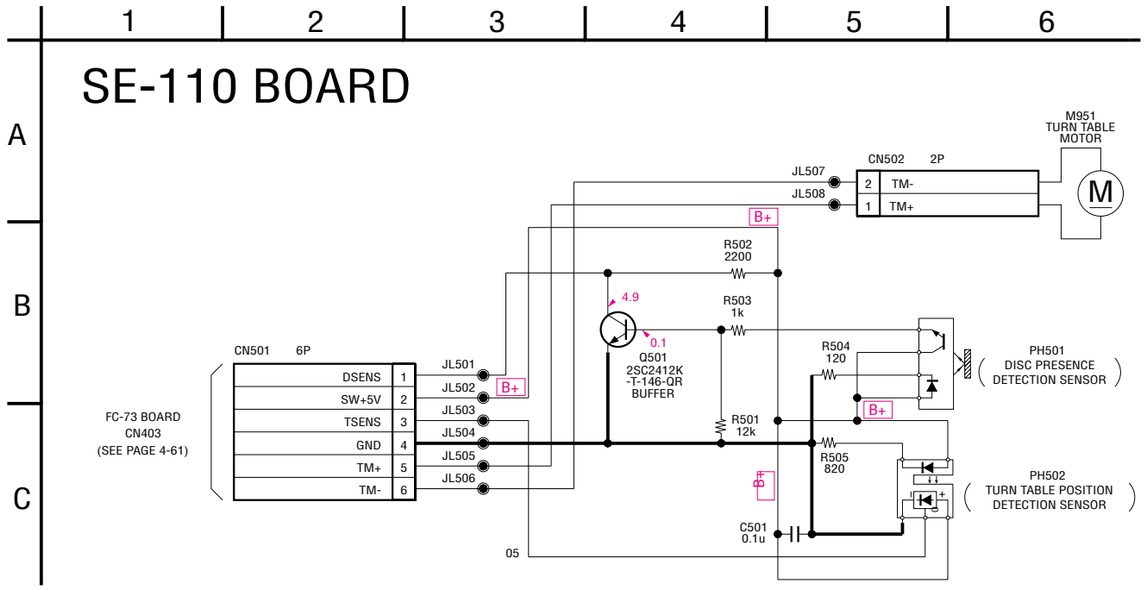


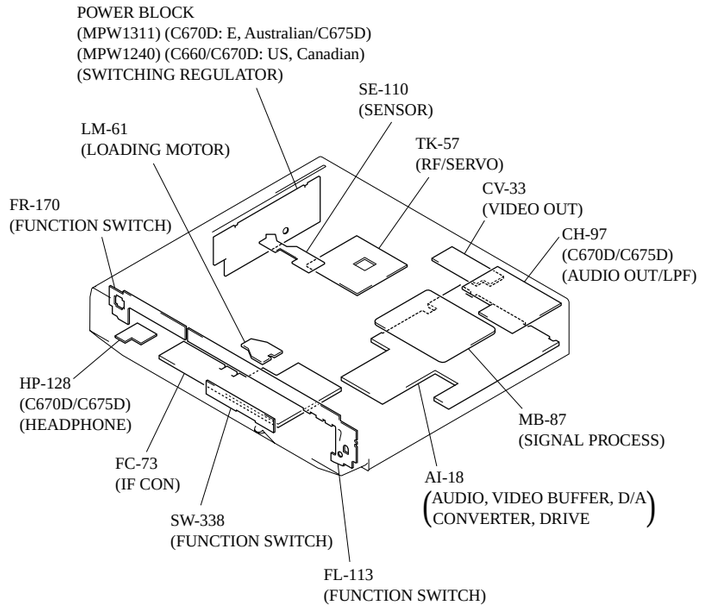
Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SE-110 (SENSOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: SE-110 board; 3,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

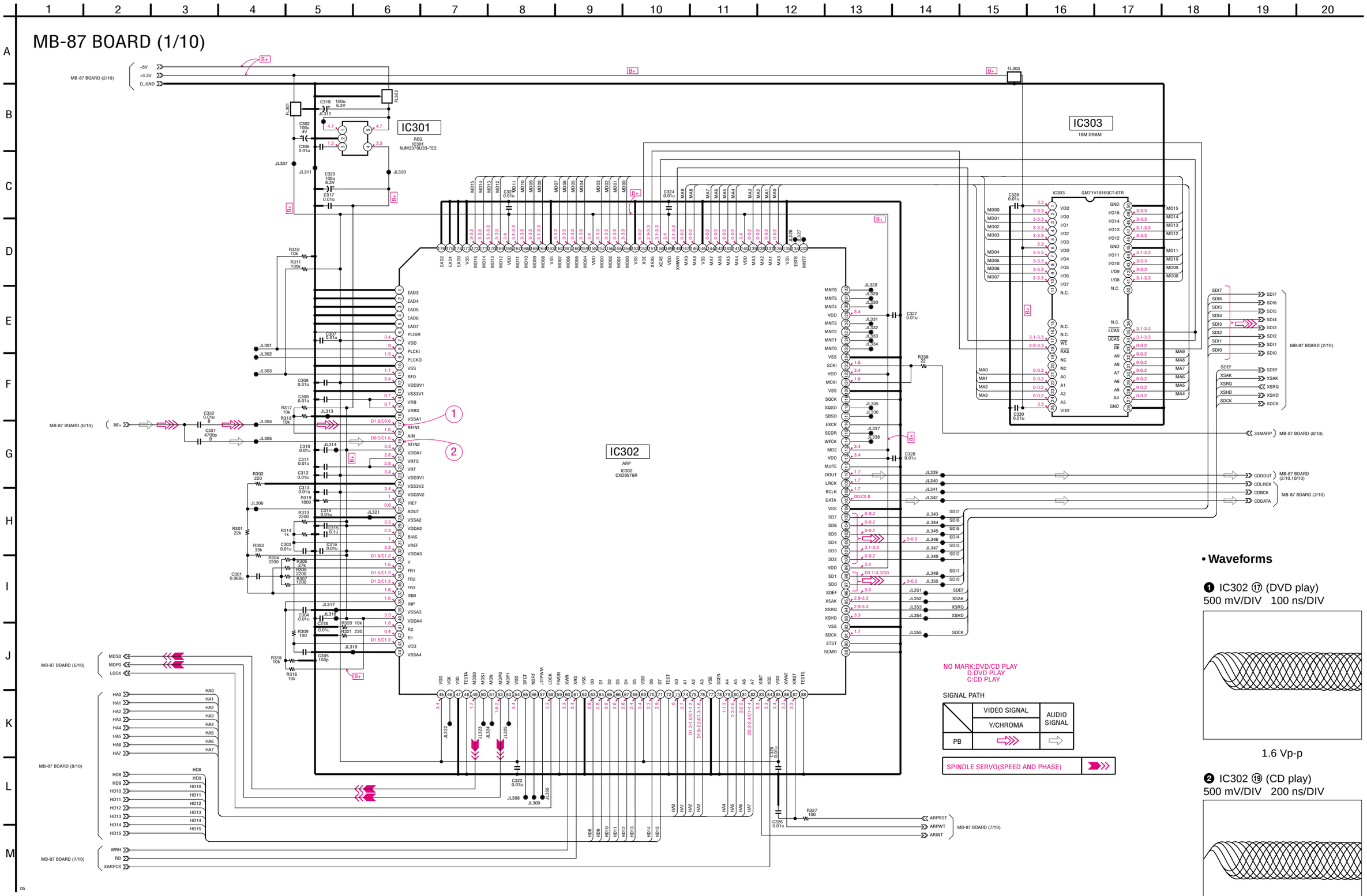




MB-87 (ARP) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-87 board; 1,000 series –

MB-87 BOARD (1/10)

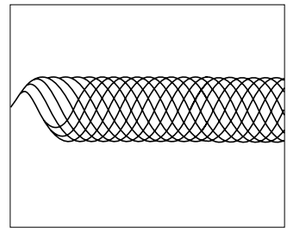


• **Waveforms**

❶ IC302 ⑰ (DVD play)
500 mV/DIV 100 ns/DIV

1.6 Vp-p

❷ IC302 ⑲ (CD play)
500 mV/DIV 200 ns/DIV

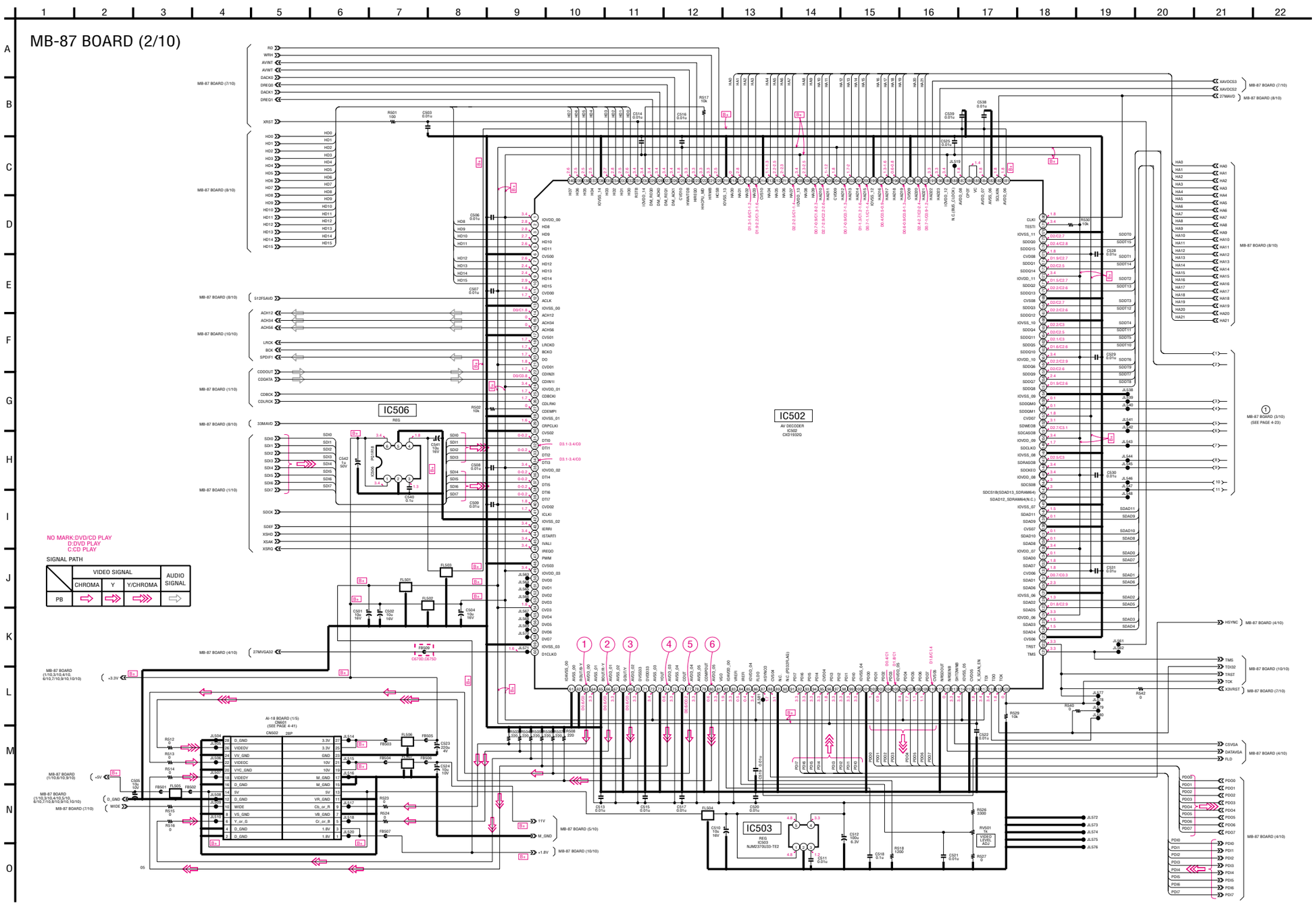


1.6 Vp-p

ARP
MB-87 (1/10)

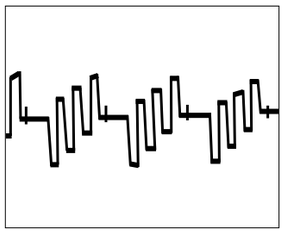
MB-87 (AV DECODER) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-87 board; 1,000 series –



• **Waveforms**

❶ IC502 ⑥③

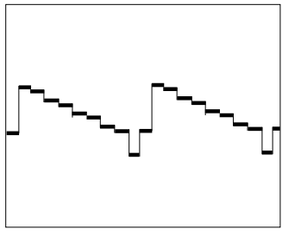


720 mVp-p (H)

❷ IC502 ⑥⑥

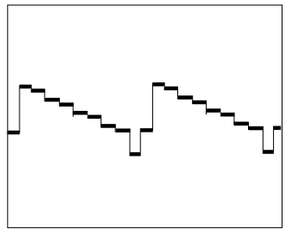
728 mVp-p (H)

❸ IC502 ⑥⑨



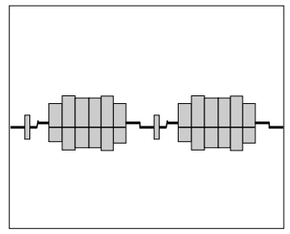
1.0 Vp-p (H)

❹ IC502 ⑦④



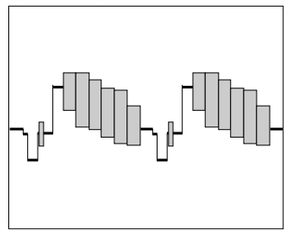
1.1 Vp-p (H)

❺ IC502 ⑦⑦



520 mVp-p (H)

❻ IC502 ⑧⓪



1.2 Vp-p (H)

AV DECODER
MB-87 (2/10)

MB-87 (SDRAM) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-87 board; 1,000 series –

MB-87 BOARD (3/10)

NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY

IC504
16M SDRAM

IC504 MT48LC1M16A1TG-7S

C532 0.01u
C533 0.01u
C534 0.01u
C535 0.01u
C536 0.01u
C537 0.01u

3.3	1	VCC	VSS	50		
SDDT0	D1.9/C2.7	2	DQ0	DQ15	49	D2.4/C2.8	SDDT15
SDDT1	D1.9/C2.7	3	DQ1	DQ14	48	D2.1/C2.5	SDDT14
		4	VSSQ	VSSQ	47		
SDDT2	D1.5/C2.7	5	DQ2	DQ13	46	D2.1/C2.6	SDDT13
SDDT3	D2/C2.7	6	DQ3	DQ12	45	D2.1/C2.6	SDDT12
	3.3	7	VCCQ	VCCQ	44	3.3	
SDDT4	D2.3/C3	8	DQ4	DQ11	43	D2.1/C2.5	SDDT11
SDDT5	D2.2/C3	9	DQ5	DQ10	42	D1.5/C2.6	SDDT10
		10	VSSQ	VSSQ	41		
SDDT6	D2.1/C2.9	11	DQ6	DQ9	40	D2.1/C2.6	SDDT9
SDDT7	2.3	12	DQ7	DQ8	39	D1.9/C2.6	SDDT8
	3.3	13	VCCQ	VCCQ	38	3.3	
	0.1	14	DQML	N.C.	37		
	3	15	WE	DQMU	36	0.1	
	D2.7/C3.1	16	CAS	CLK	35	1.6	
	D2.5/C3	17	RAS	CKE	34	3.3	
	3	18	CS	N.C.	33		
SDAD11	1.5	19	A11(BA)	A9	32	0.1	SDAD9
SDAD10	0.1	20	A10/AP	A8	31	0.1	SDAD8
SDAD0	0.1	21	A0	A7	30	1.8	SDAD7
SDAD1	D0.7/C0.3	22	A1	A6	29	D2.3/C2.9	SDAD6
SDAD2	1.2	23	A2	A5	28	1.7	SDAD5
SDAD3	1.5	24	A3	A4	27	1.4	SDAD4
	3.3	25	VCC	VSS	26		

IC505
16M SDRAM

IC505 MT48LC1M16A1TG-7S

3.3	1	VCC	VSS	50		
SDDT0	D1.9/C2.7	2	DQ0	DQ15	49	D2.4/C2.8	SDDT15
SDDT1	D1.9/C2.7	3	DQ1	DQ14	48	D2.1/C2.5	SDDT14
		4	VSSQ	VSSQ	47		
SDDT2	D1.5/C2.7	5	DQ2	DQ13	46	D2.1/C2.6	SDDT13
SDDT3	D2/C2.7	6	DQ3	DQ12	45	D2.1/C2.6	SDDT12
	3.3	7	VCCQ	VCCQ	44	3.3	
SDDT4	D2.3/C3	8	DQ4	DQ11	43	D2.1/C2.5	SDDT11
SDDT5	D2.2/C3	9	DQ5	DQ10	42	D1.5/C2.6	SDDT10
		10	VSSQ	VSSQ	41		
SDDT6	D2.1/C2.9	11	DQ6	DQ9	40	D2.1/C2.6	SDDT9
SDDT7	2.3	12	DQ7	DQ8	39	D1.9/C2.6	SDDT8
	3.3	13	VCCQ	VCCQ	38	3.3	
	0.1	14	DQML	N.C.	37		
	3	15	WE	DQMU	36	0.1	
	D2.7/C3.1	16	CAS	CLK	35	1.6	
	D2.5/C3	17	RAS	CKE	34	3.3	
	3	18	CS	N.C.	33		
SDAD11	1.5	19	A11(BA)	A9	32	0.1	SDAD9
SDAD10	0.1	20	A10/AP	A8	31	0.1	SDAD8
SDAD0	0.1	21	A0	A7	30	1.8	SDAD7
SDAD1	D0.7/C0.3	22	A1	A6	29	D2.3/C2.9	SDAD6
SDAD2	1.2	23	A2	A5	28	1.7	SDAD5
SDAD3	1.5	24	A3	A4	27	1.4	SDAD4
	3.3	25	VCC	VSS	26		

B+

FB508 10 C

FL508

D_GND
+3.3V
MB-87 BOARD (2/10)

1 MB-87 BOARD (2/10) (SEE PAGE 4-22)

2 3 4 5 6 7 8 9 10 11

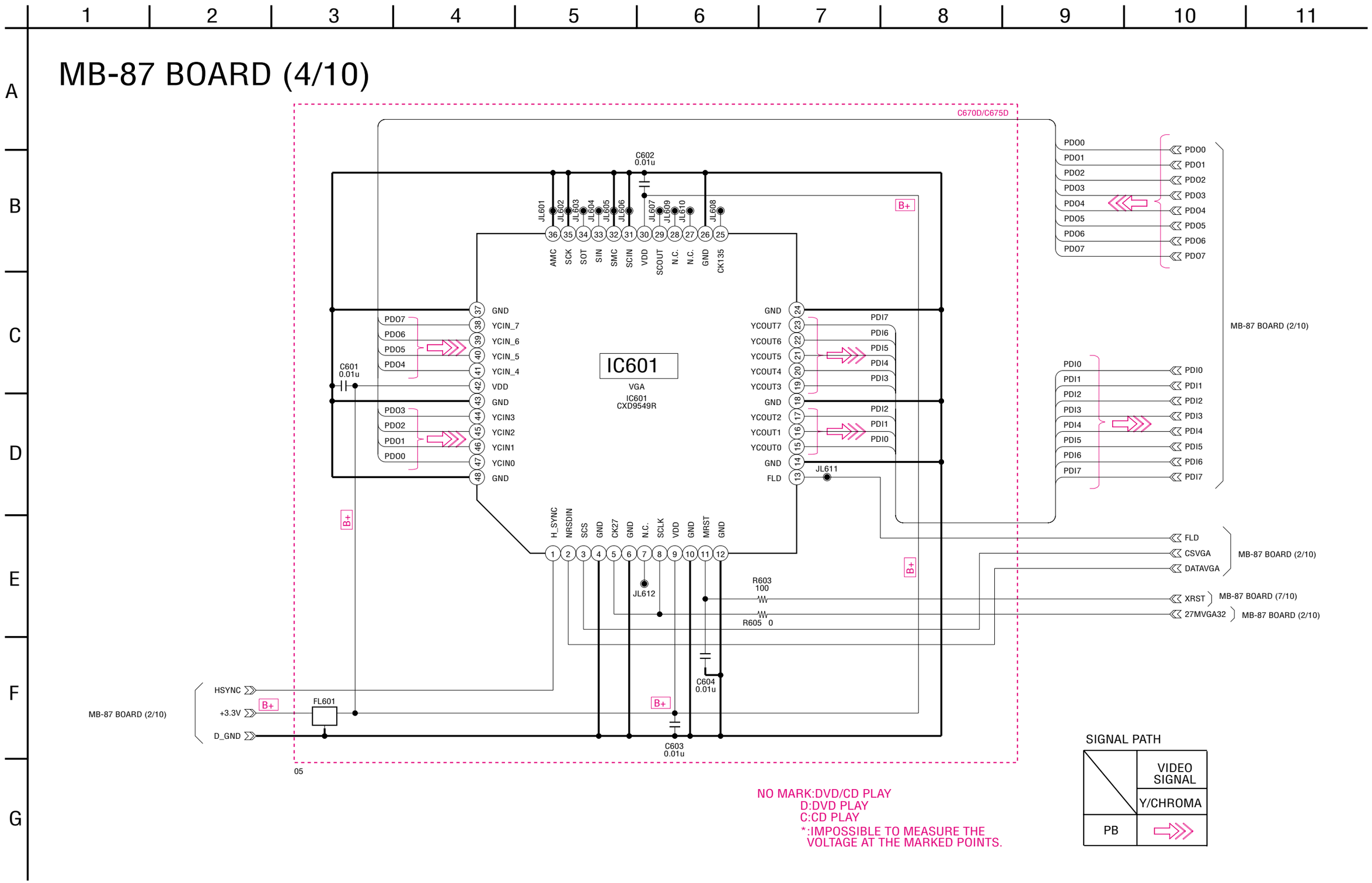
05

SDRAM
MB-87 (3/10)

MB-87 (VGA) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-87 board; 1,000 series –

MB-87 BOARD (4/10)



NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY
*:IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.

SIGNAL PATH

	VIDEO SIGNAL
	Y/CHROMA
PB	⇨

MB-87 (DRIVE) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-87 board; 1,000 series –

MB-87 BOARD (5/10)

NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

IC401
FOCUS/TRACKING COIL DRIVE TILT MOTOR DRIVE
IC401
LA6553-TE-L

IC402
SPINDLE/SLED/ MOTOR DRIVE
IC402
LA6553-TE-L

CN405 16P
XDRVMUTE 1
TRK- 2
TRK+ 3
FCS- 4
FCS+ 5
INLIM 6
SLB- 7
SLA+ 8
SLB+ 9
SLA- 10
SPM+ 11
SPM- 12
TIB- 13
TIB+ 14
TIA- 15
TIA+ 16

TK-57 BOARD CN004 (SEE PAGE 4-12)

CN402 5P
RF 1
GND 2
FE 3
TE 4
PI 5

CHECK

MB-87 BOARD (6/10) RF_MON

MB-87 BOARD (2/10) 11V M_GND

MB-87 BOARD (7/10) XDRVMUTE

② MB-87 BOARD (6/10) (SEE PAGE 4-29)

SIGNAL PATH

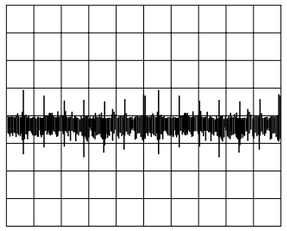
SPINDLE SERVO(SPEED AND PHASE)	
TRACKING SERVO DVD/CD CDV	
SLED SERVO DVD/CD	
FOCUS SERVO	
SKEW SERVO DVD/CD	

MB-87 (SERVO DSP) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-87 board; 1,000 series –

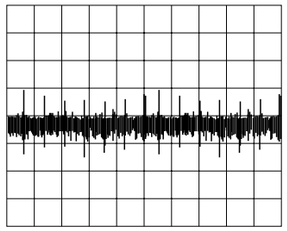
• Waveforms

❶ IC404 ㉒ (DVD play)
100 mV/DIV 50 ms/DIV



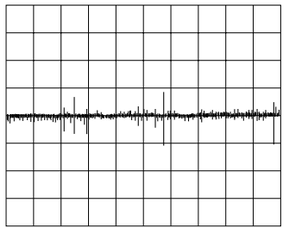
180 mVp-p

❶ IC404 ㉒ (CD play)
500 mV/DIV 50 ms/DIV



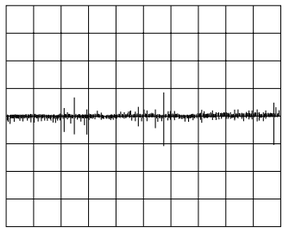
860 mVp-p

❷ IC404 ㉓ (DVD play)
500 mV/DIV 50 ms/DIV

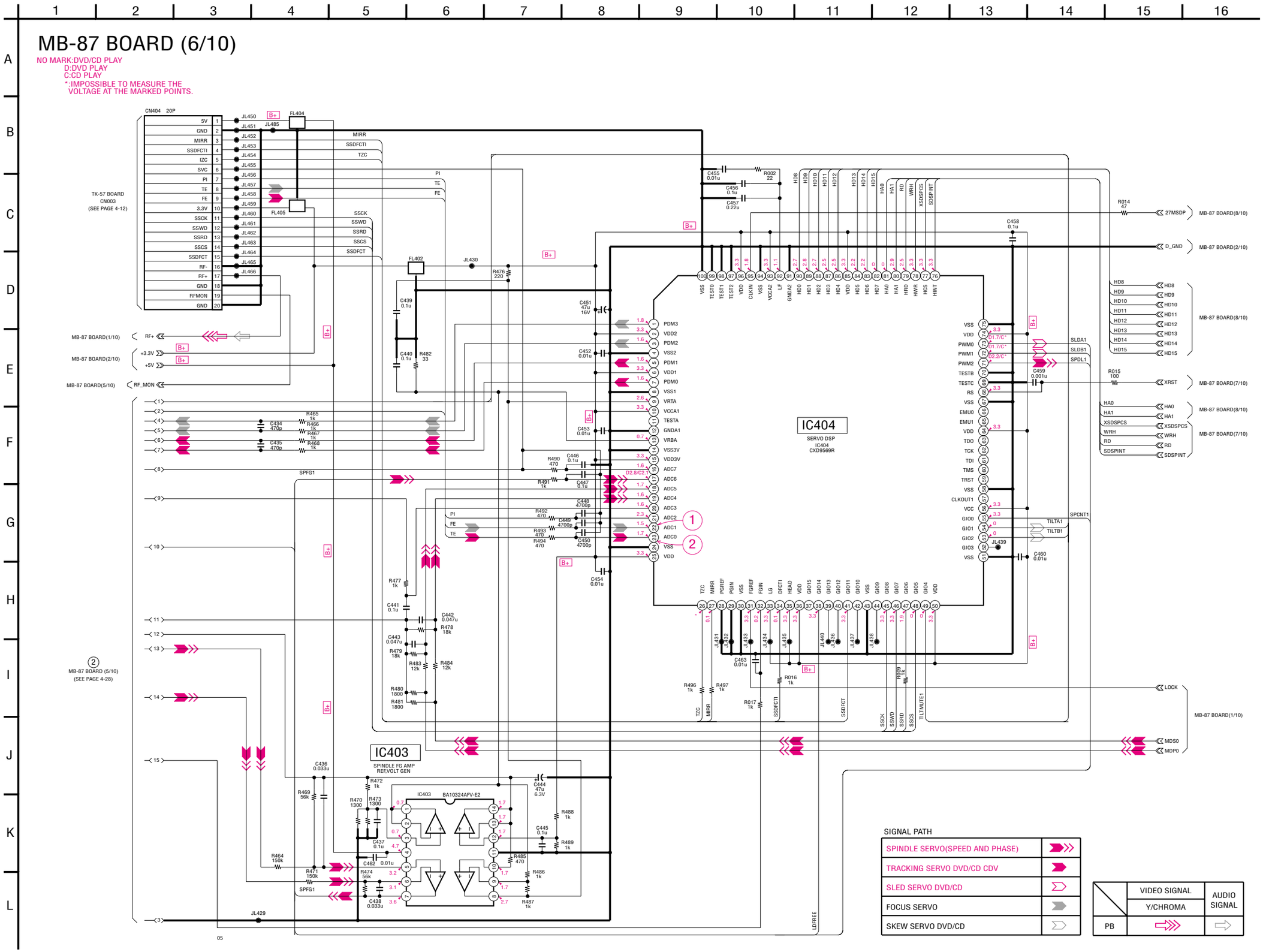


1.4 Vp-p

❷ IC404 ㉓ (CD play)
500 mV/DIV 200 mV/DIV



1.7 Vp-p



SERVO DSP
MB-87 (6/10)

MB-87 (SYSTEM CONTROL) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-87 board; 1,000 series –

MB-87 BOARD (7/10)

NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY
*:IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.

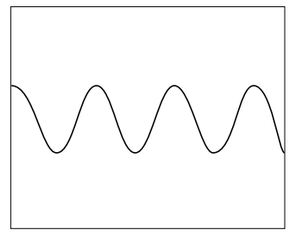
IC101
EEPROM
IC101
BR9040F-D-E2

IC102
SYSTEM CONTROL
IC102
MB91107PFV-G-BND

IC103
RESET
IC103
PST9126NL

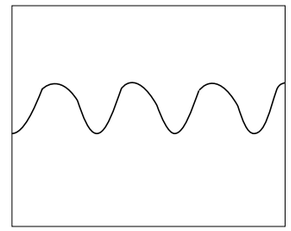
• Waveforms

❶ IC102 (54)



2.4 Vp-p (12.5 MHz)

❷ IC102 (71)

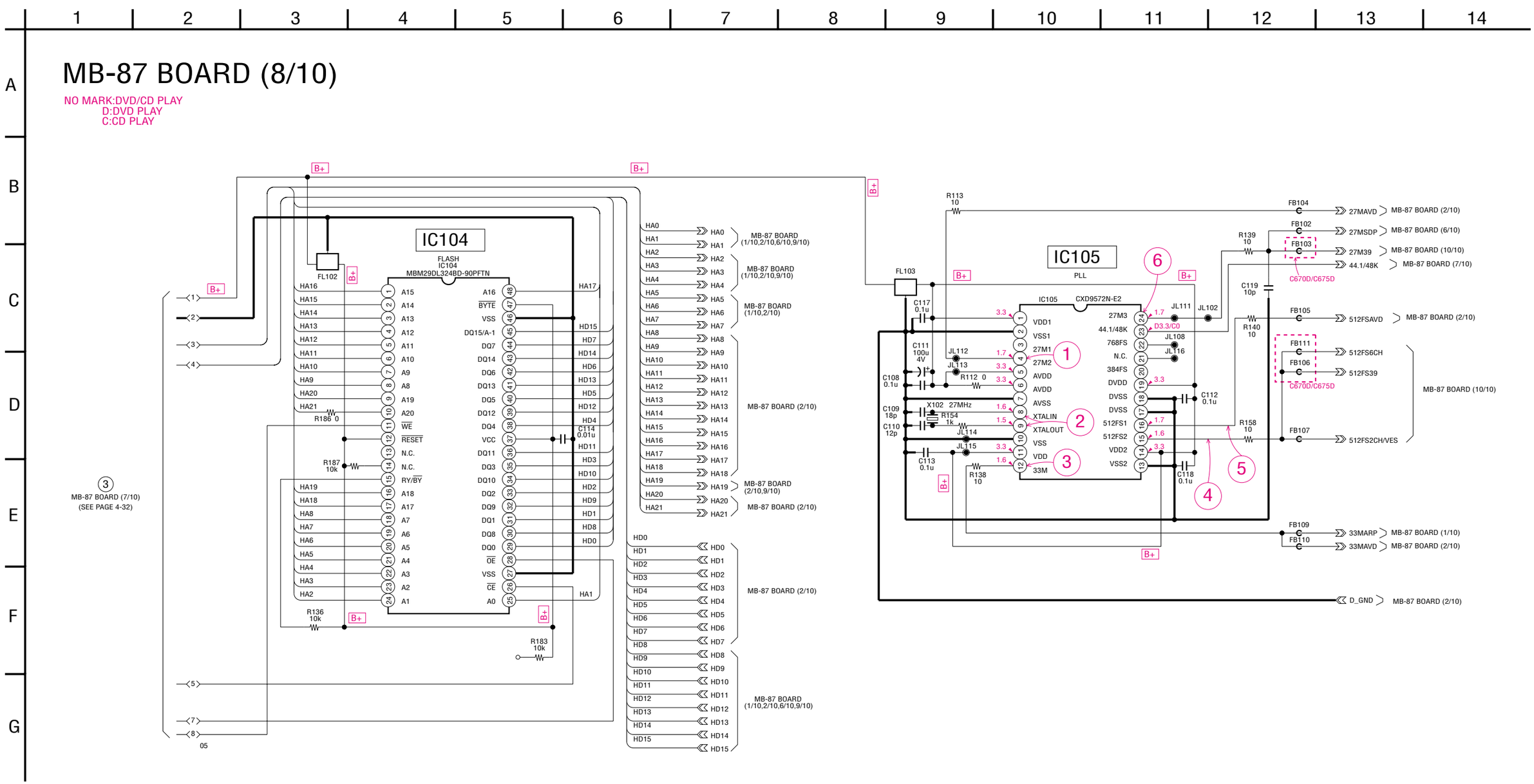


4 Vp-p (25.3 MHz)

MB-87 (MEMORY, CLOCK GENERATOR) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.
– Ref. No.: MB-87 board; 1,000 series –

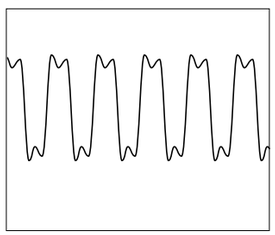
MB-87 BOARD (8/10)

NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY



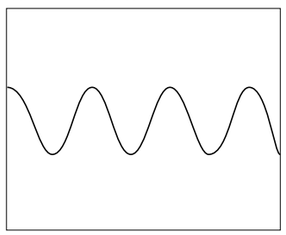
• Waveforms

❶ IC105 ④



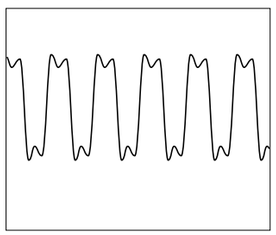
5.2 Vp-p (27 MHz)

❷ IC105 ⑧, ⑨



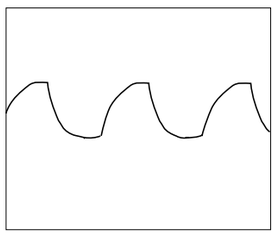
2.5 Vp-p (27 MHz)

❸ IC105 ⑫



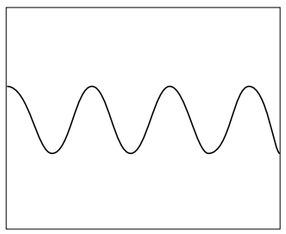
4.9 Vp-p (33.8688 MHz)

❹ IC105 ⑮



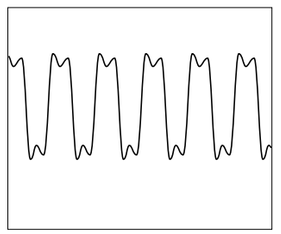
DVD : 3.4 Vp-p (29.5 MHz)
CD : 3.4 Vp-p (22.58 MHz)

❺ IC105 ⑯



DVD : 4.3 Vp-p (29.5 MHz)
CD : 4.3 Vp-p (22.58 MHz)

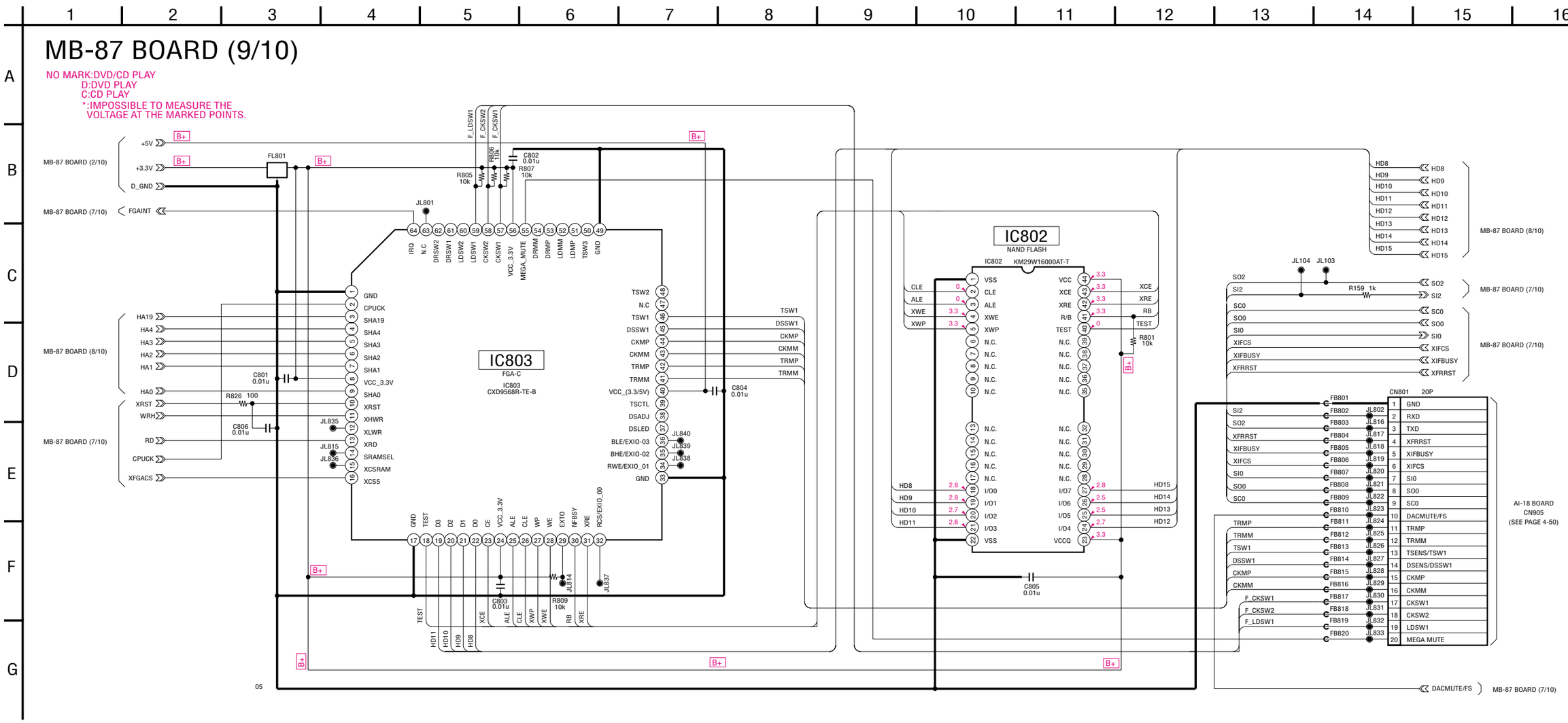
❻ IC105 ㉔



4.9 Vp-p (27.2 MHz)

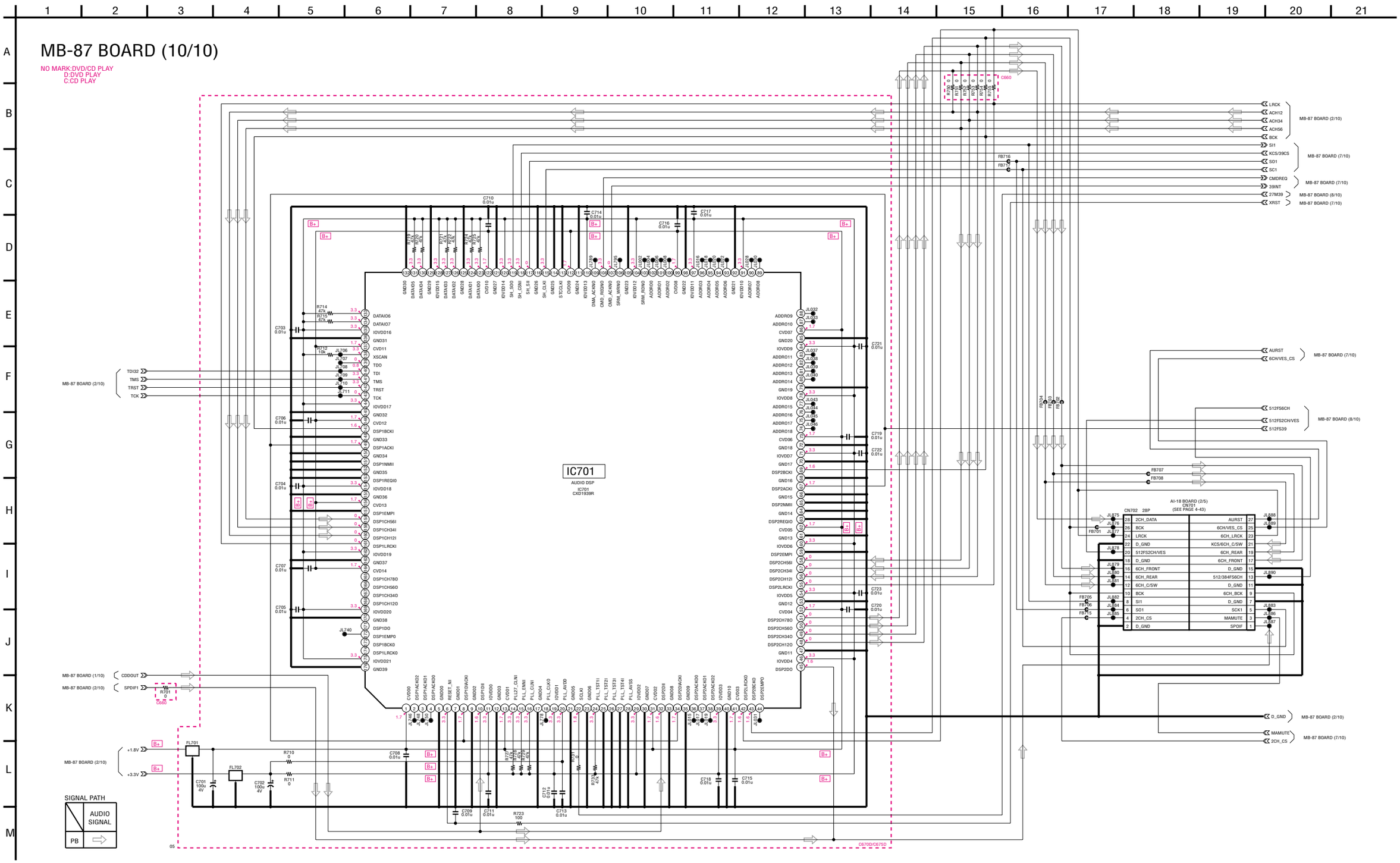
MB-87 (FGA) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-87 board; 1,000 series –



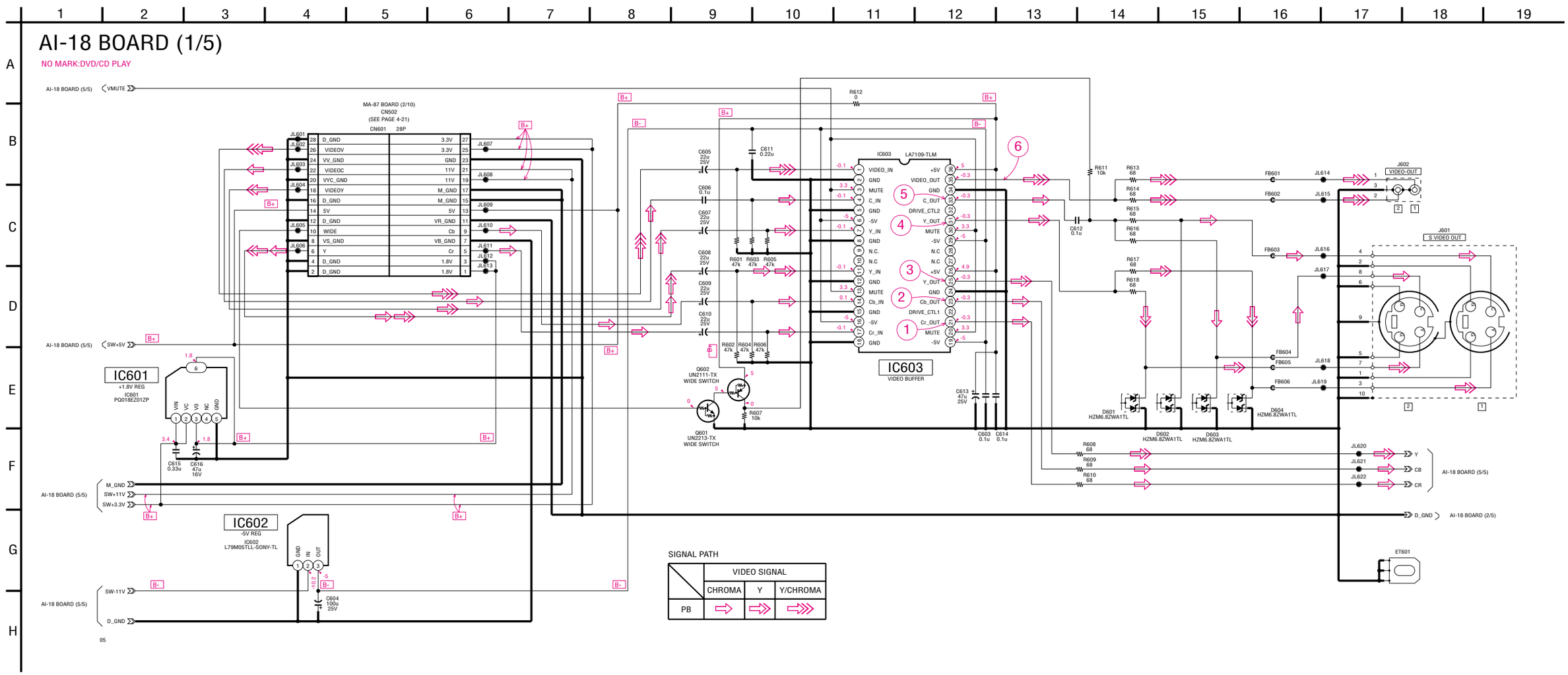
MB-87 (AUDIO DSP) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-87 board; 1,000 series –



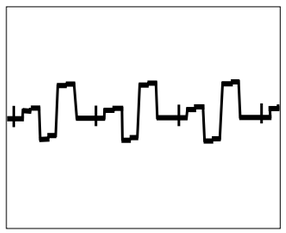
AI-18 (VIDEO BUFFER) SCHEMATIC DIAGRAM • See page 4-39 for printed wiring board.

– Ref. No.: AI-18 board; 2,000 series –



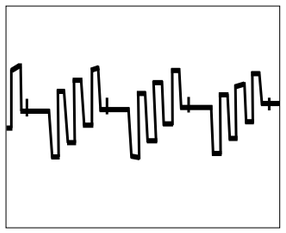
• **Waveforms**

❶ IC603 ㉑



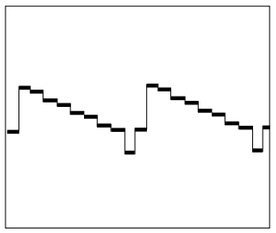
728 mVp-p (H)

❷ IC603 ㉓



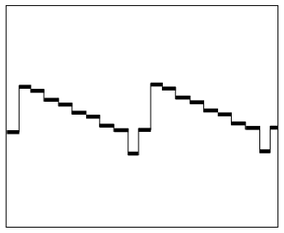
720 mVp-p (H)

❸ IC603 ㉕



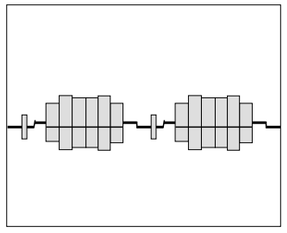
1.0 Vp-p (H)

❹ IC603 ㉛



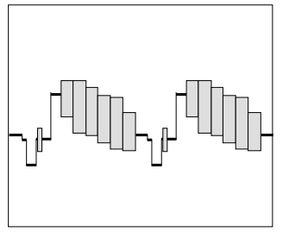
2.1 Vp-p (H)

❺ IC603 ㉝



520 mVp-p (H)

❻ IC603 ㉟



2.4 Vp-p (H)

VIDEO BUFFER
AI-18 (1/5)

AI-18 (D/A CONVERTER, DSP) SCHEMATIC DIAGRAM • **See page 4-39 for printed wiring board.**
– Ref. No.: AI-18 board; 2,000 series –

AI-18 BOARD (2/5)

NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY

SIGNAL PATH
AUDIO SIGNAL
PB

IC702
VES DSP
IC702
CXD9545Q

IC703
AUDIO D/A CONVERTER
IC703 CXD9544MR

IC701
+5V REG
IC701
L78M05TLL-SONY-TL

Q704 2SB709A-QRS-TX
Q702 DTC124TKA-T146
Q701 UN2213-TX
Q705 2SB709A-QRS-TX MUTE DRIVE
Q703 DTC124TKA-T146 MUTE DRIVE
Q701,702,704 MUTE DRIVE

D702 DAN202K-T-146
D703 DAN202K-T-146
D701 1SS355TE-17

MB-87 BOARD (10/10)
CN702
(SEE PAGE 4-38)
CN701 28P

JL701	27	AURST	2CH_DATA	28	JL710
JL702	25	6CH/VES_CS	BCK	26	JL711
JL703	23	6CH_LRCK	LRCK	24	JL712
JL704	21	KCS/6CH_C/SW	D_GND	22	JL713
JL705	19	6CH_REAR	512FS2H/VES	20	
	17	6CH_FRONT	D_GND	18	JL714
JL706	15	D_GND	6CH_FRONT	16	JL715
	13	512/384FS6CH	6CH_REAR	14	JL716
	11	D_GND	6CH_C/SW	12	
	9	6CH_BCK	BCK	10	JL717
	7	D_GND	SI1	8	JL718
JL707	5	SCK1	SO1	6	JL719
JL708	3	MAMUTE	2CH_CS	4	JL720
JL709	1	SPDIF	D_GND	2	

*R712
0:C660
220:C670D/C675D

AI-18 (AMP, LPF) SCHEMATIC DIAGRAM • See page 4-39 for printed wiring board.

– Ref. No.: AI-18 board; 2,000 series –

AI-18 BOARD (3/5)

NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY

SIGNAL PATH

AUDIO SIGNAL

PB

IC706 HEADPHONE AMP

IC704 AMP/LPF

Q716-718 MUTE DRIVE

Q710 2SD601A-QRS-TX RELAY DRIVE

Q712 2SD1938(F)-T(TX).SO FILTER CONT

Q713 UN2113-TX FILTER CONT DRIVE

Q708,709 MUTE

*C771,772 3300p:C670D/C675D 3900p:C660

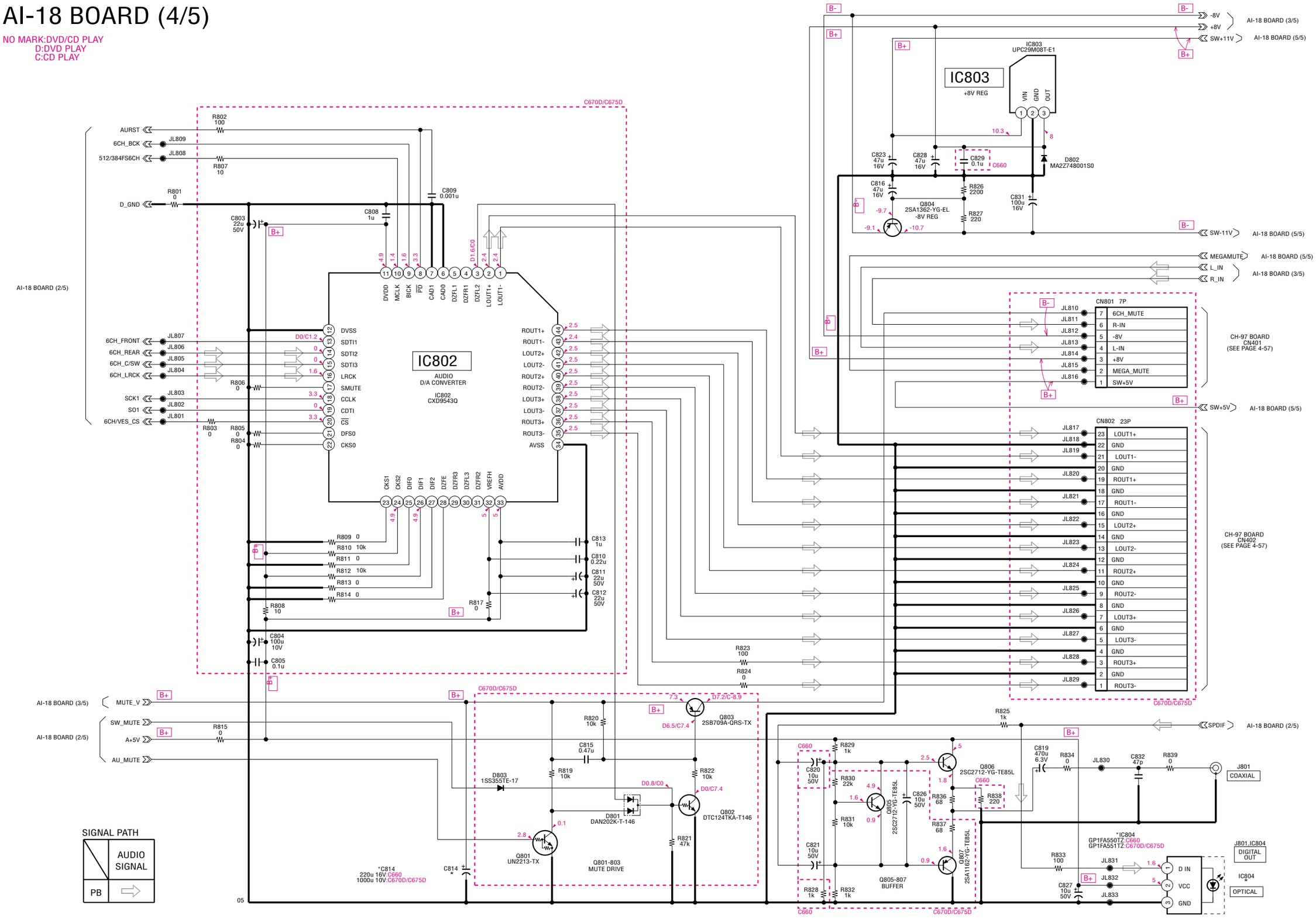
AMP, LPF
AI-18 (3/5)

AI-18 (D/A CONVERTER) SCHEMATIC DIAGRAM • See page 4-39 for printed wiring board.

– Ref. No.: AI-18 board; 2,000 series –

AI-18 BOARD (4/5)

NO MARK:DVD/CD PLAY
D:DVD PLAY
C:CD PLAY



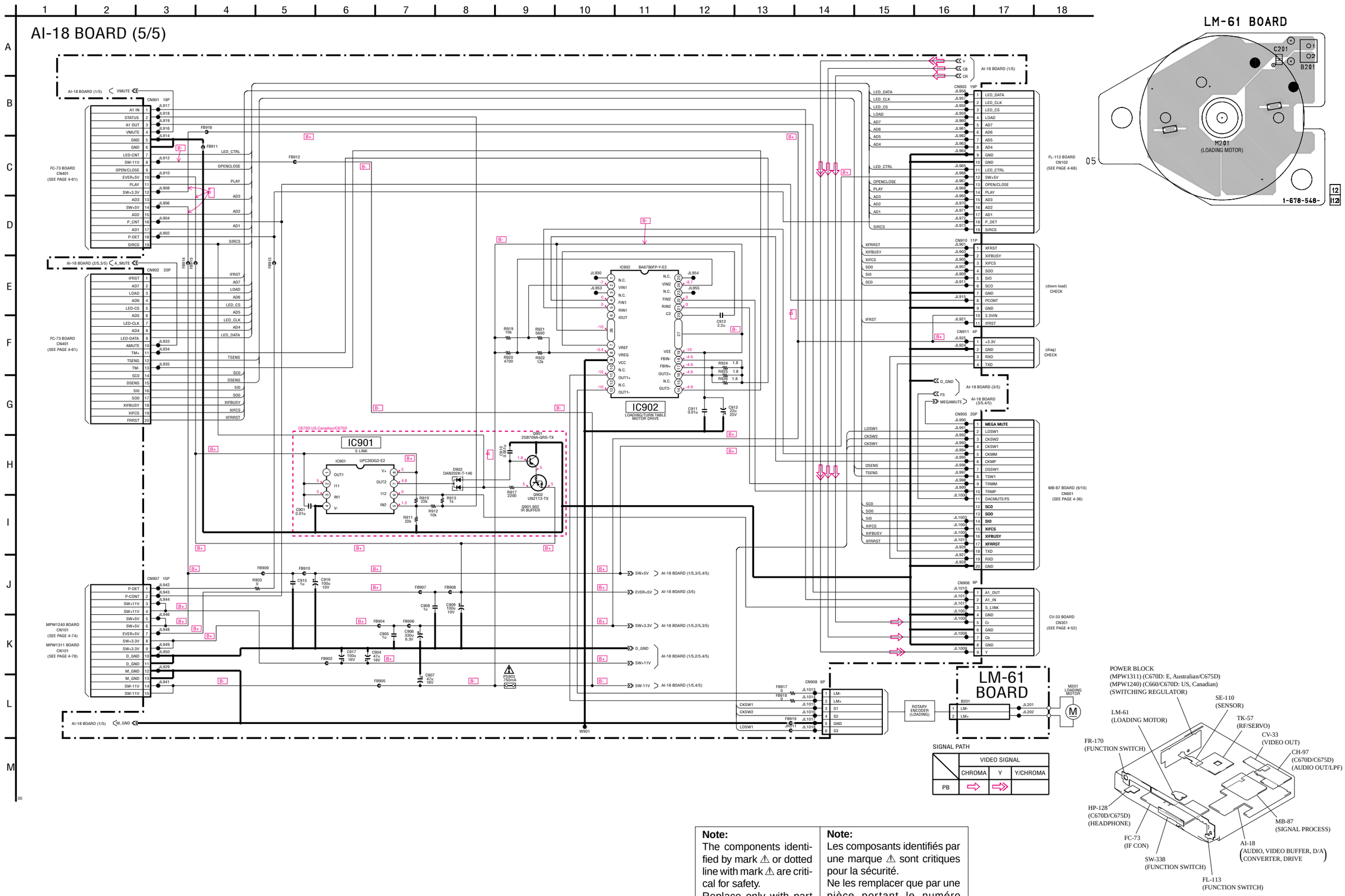
D/A CONVERTER
AI-18 (4/5)

AI-18 (DRIVE) SCHEMATIC DIAGRAM, LM-61 (LOADING MOTOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

• See page 4-39 for AI-18 printed wiring board.

– Ref. No.: AI-18 board, LM-61 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

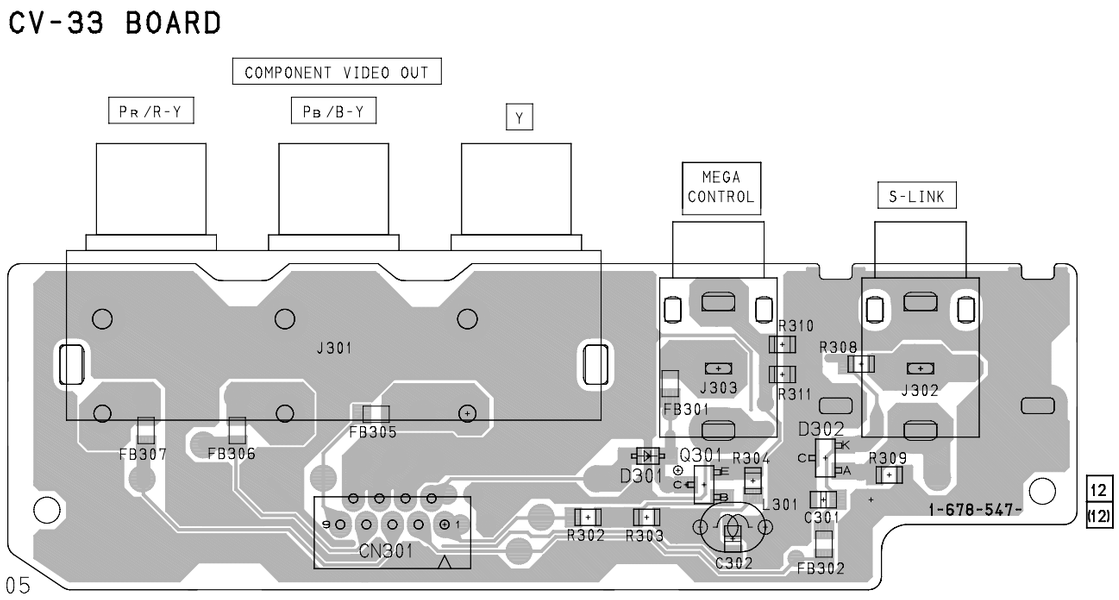


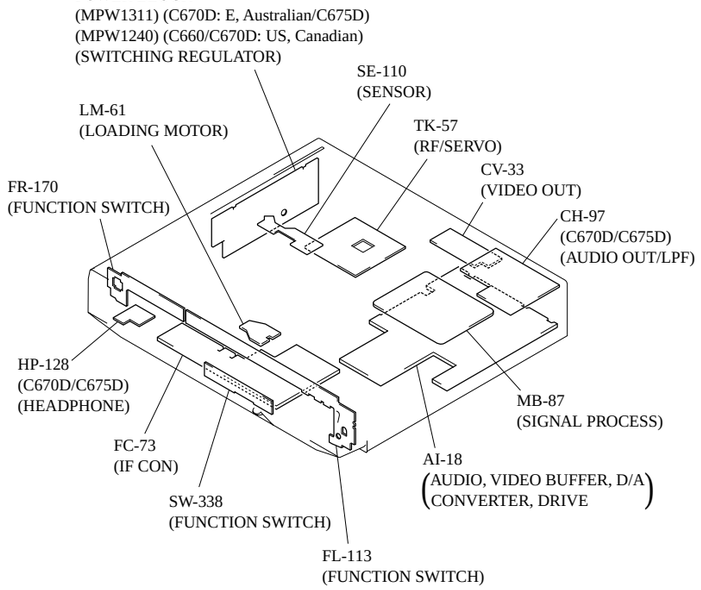
Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

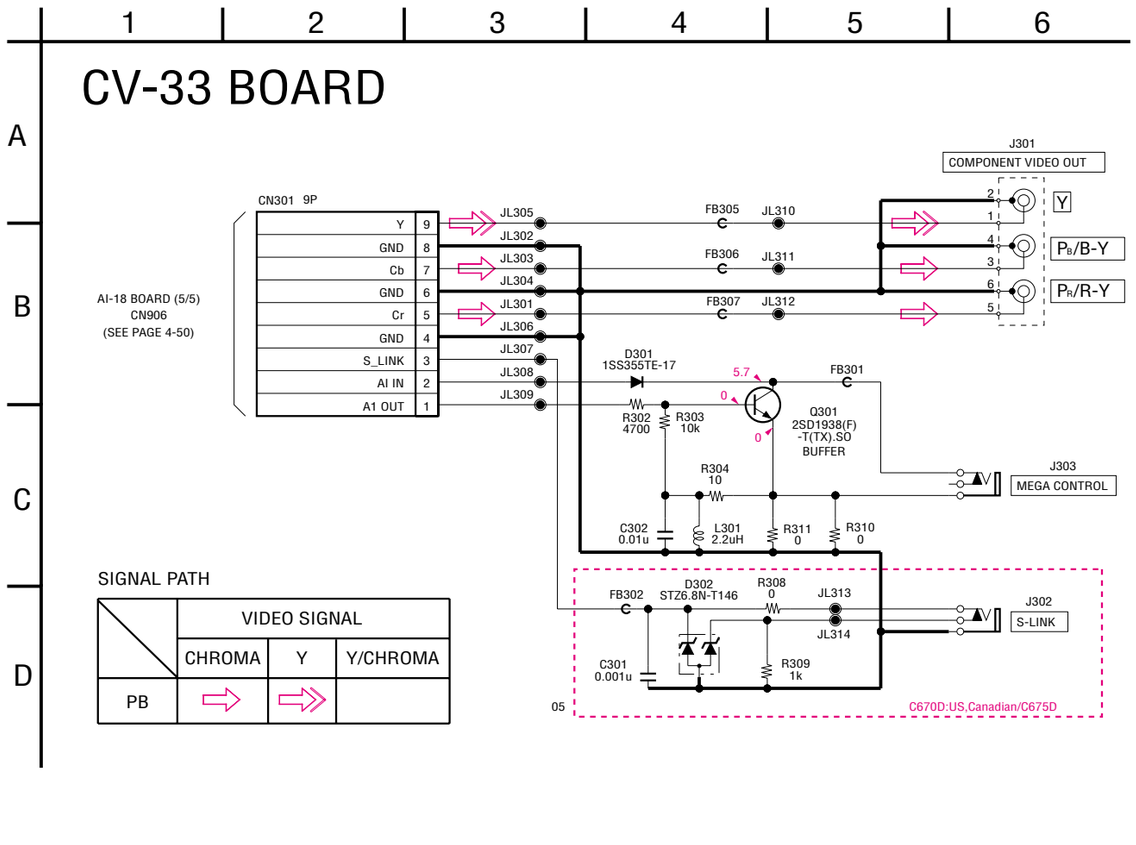
CV-33 (VIDEO OUT) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: CV-33 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

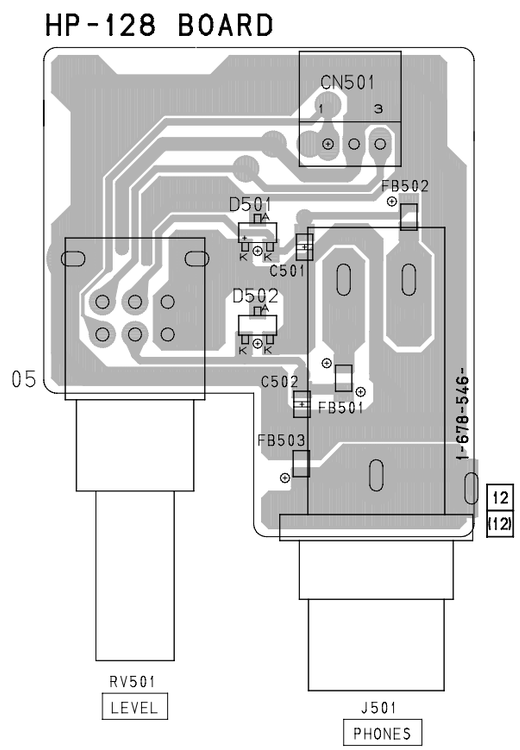


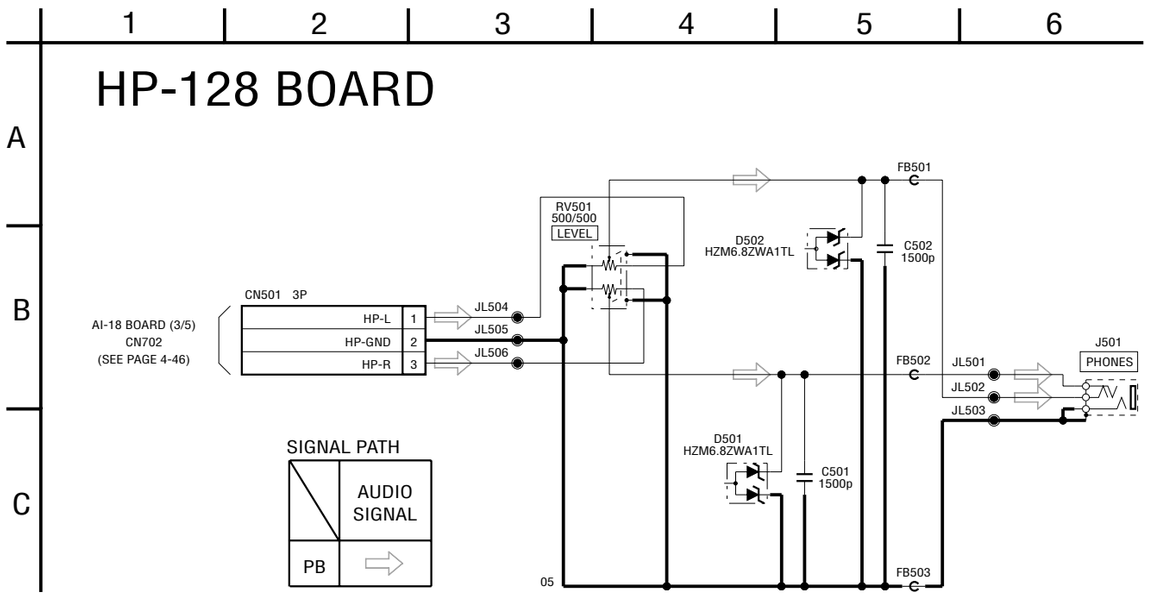


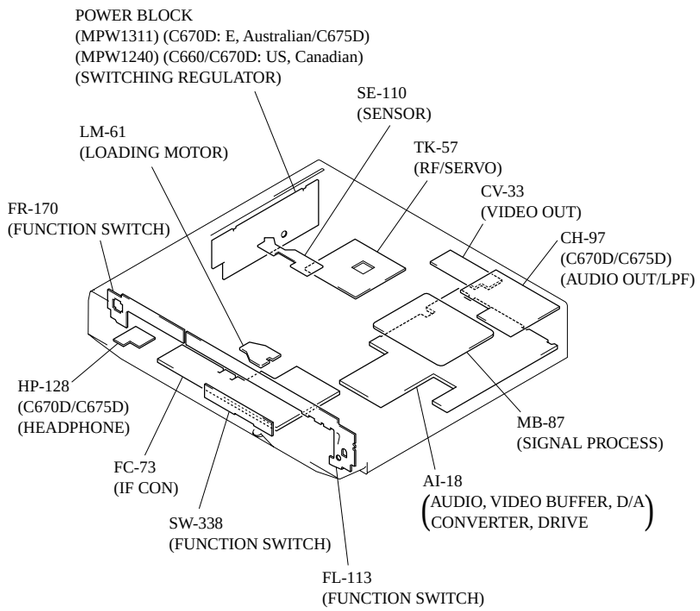


HP-128 (HEADPHONE) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM
– Ref. No.: HP-128 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

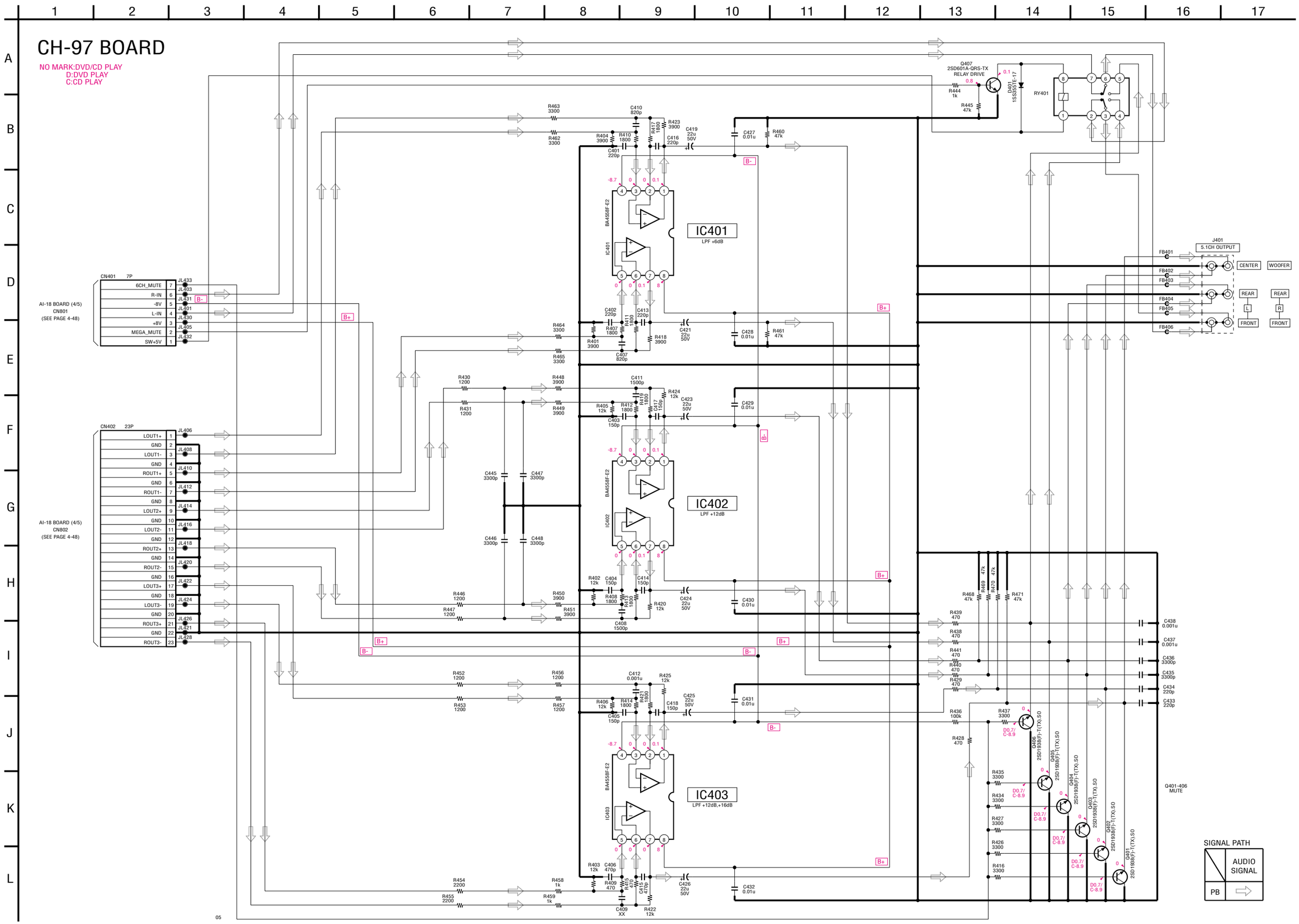






CH-97 (AUDIO OUT/LPF) SCHEMATIC DIAGRAM

– Ref. No.: CH-97 board; 2,000 series –



AUDIO OUT/LPF
CH-97

FC-73 (IF CON) SCHEMATIC DIAGRAM

– Ref. No.: FC-73 board; 3,000 series –

FC-73 BOARD

NO MARK:DVD/CD PLAY
*:IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.

CN401 19P
A1 IN 1
STATUS 2
A1 OUT 3
VMUTE 4
GND 5
GND 6
LED-CNT 7
SW-11V 8
OPEN/CLOSE 9
EVER+5V 10
PLAY 11
SW+3.3V 12
AD3 13
SW+5V 14
AD2 15
P_CNT 16
AD1 17
P-DET 18
SIRCS 19

AI-18 BOARD (5/5) CN901 (SEE PAGE 4-49)

CN402 20P
IFRST 1
AD7 2
LOAD 3
AD6 4
LED-CS 5
AD5 6
LED-CLK 7
AD4 8
LED-DATA 9
AMUTE 10
TM+ 11
TSENS 12
TM- 13
SC0 14
DSENS 15
SI0 16
SO0 17
XIFBUSY 18
XIFCS 19
FRRST 20

AI-18 BOARD (5/5) CN902 (SEE PAGE 4-49)

CN403 6P
DSENS 1
SW+5V 2
TSENS 3
GND 4
TM+ 5
TM- 6

SE-110 BOARD CN501 (SEE PAGE 4-14)

IC403
BUFFER
IC403
TC74HCT08AF(EL)

IC401
IF COM
IC401
M38B57M6-150FP

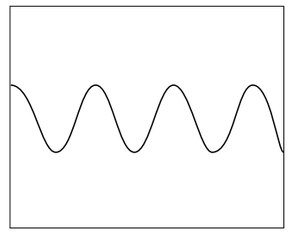
IC402
RESET
IC402
PST9140NL

ND401
FLUORESCENT INDICATOR TUBE

Q403 UN2213-TX BUFFER
Q401,402 DC/DC CONVERTER
Q401 2SD1624-T-TD
Q402 2SD1624-T-TD
T401 DC/DC CONVERTER
D001 DAP202K-T-146
D408 1SS355TE-17
D401 MA113-(TX)
D402 MA113-(TX)
D403 MA113-(TX)
D404 MA113-(TX)
D405 1SS355TE-17
D406 MA8075-H-TX
X401 4MHz
BZ401

• Waveform

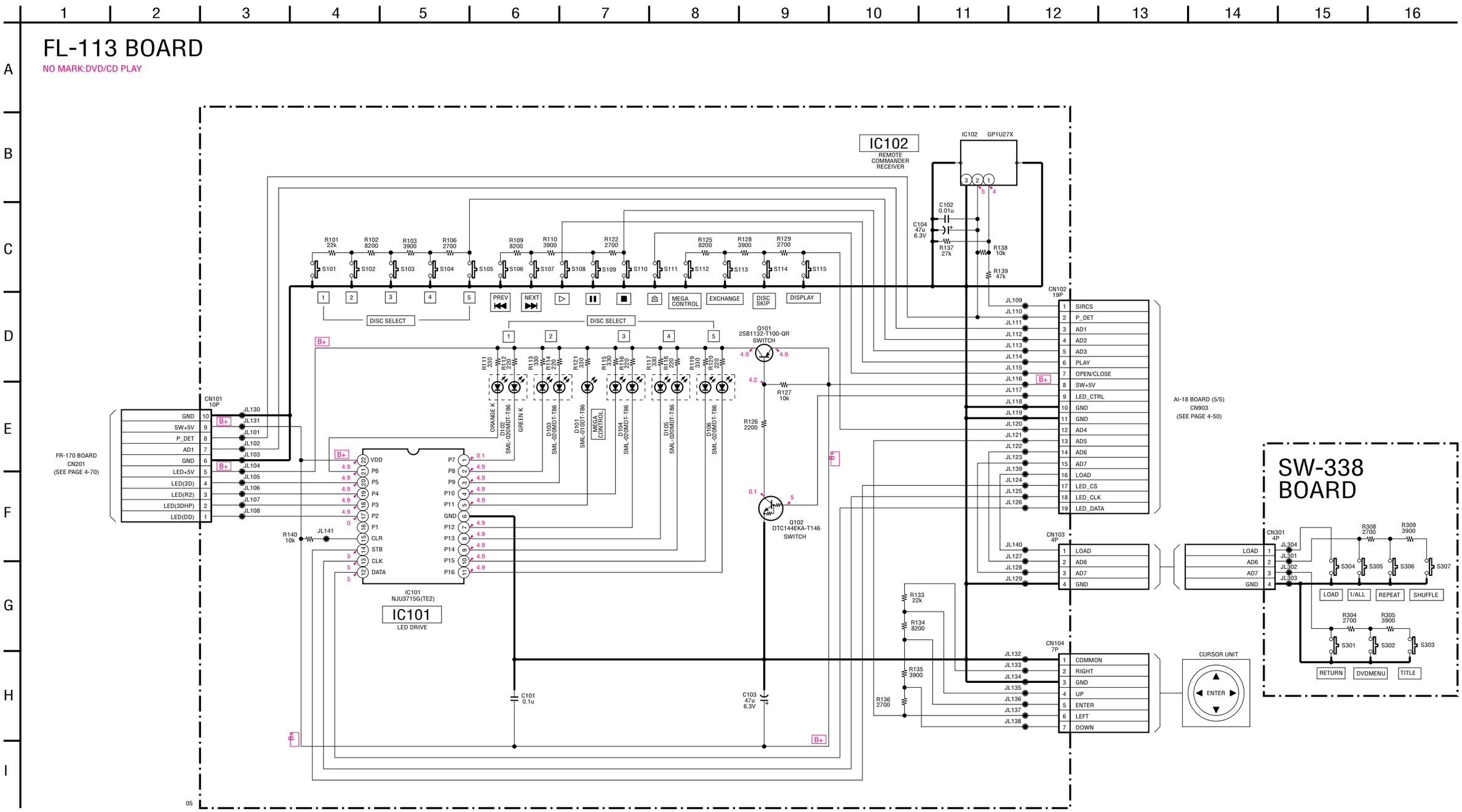
❶ IC401 ⑮



3.2 Vp-p (4 MHz)

FL-113 (FUNCTION SWITCH), SW-338 (FUNCTION SWITCH) SCHEMATIC DIAGRAM

– Ref. No.: FL-113 board, SW-338 board; 4,000 series –

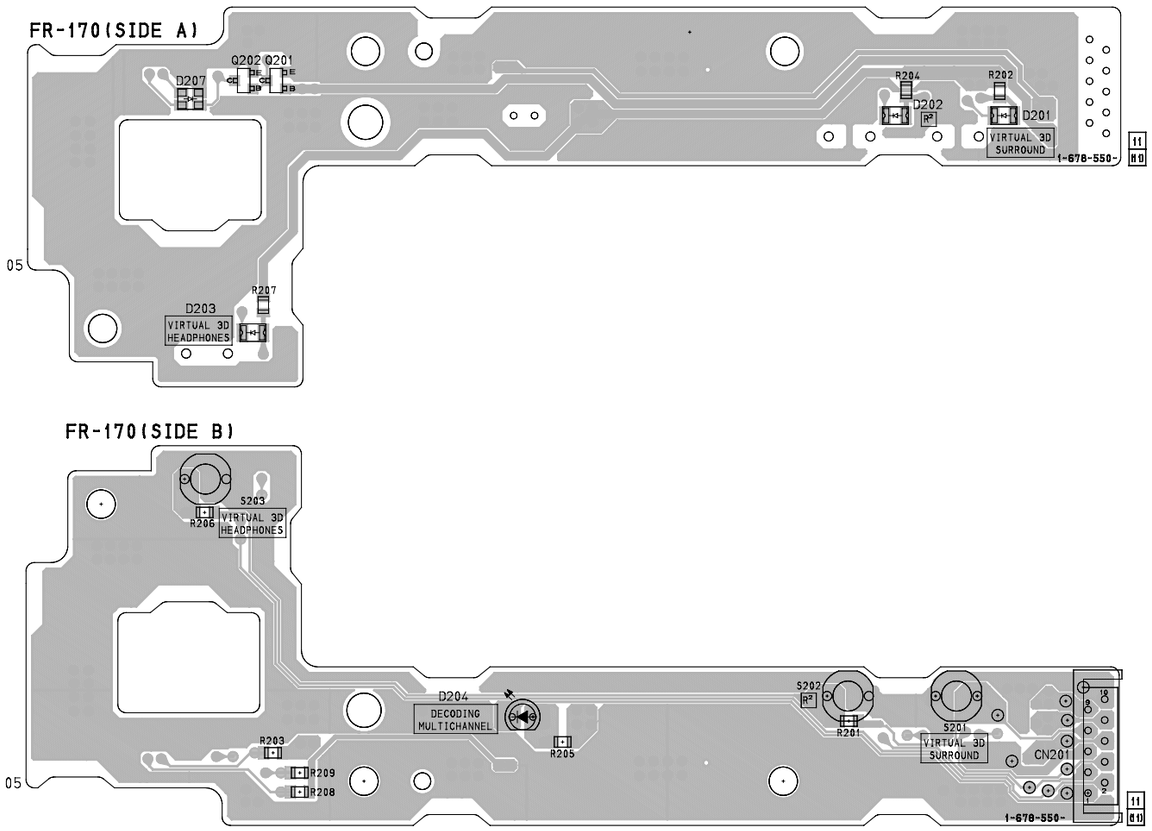


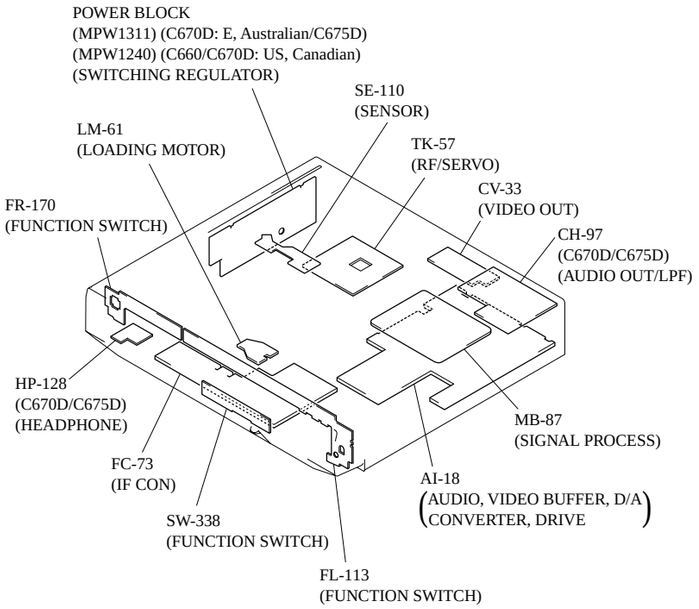
FUNCTION SWITCH
FL-113, SW-338

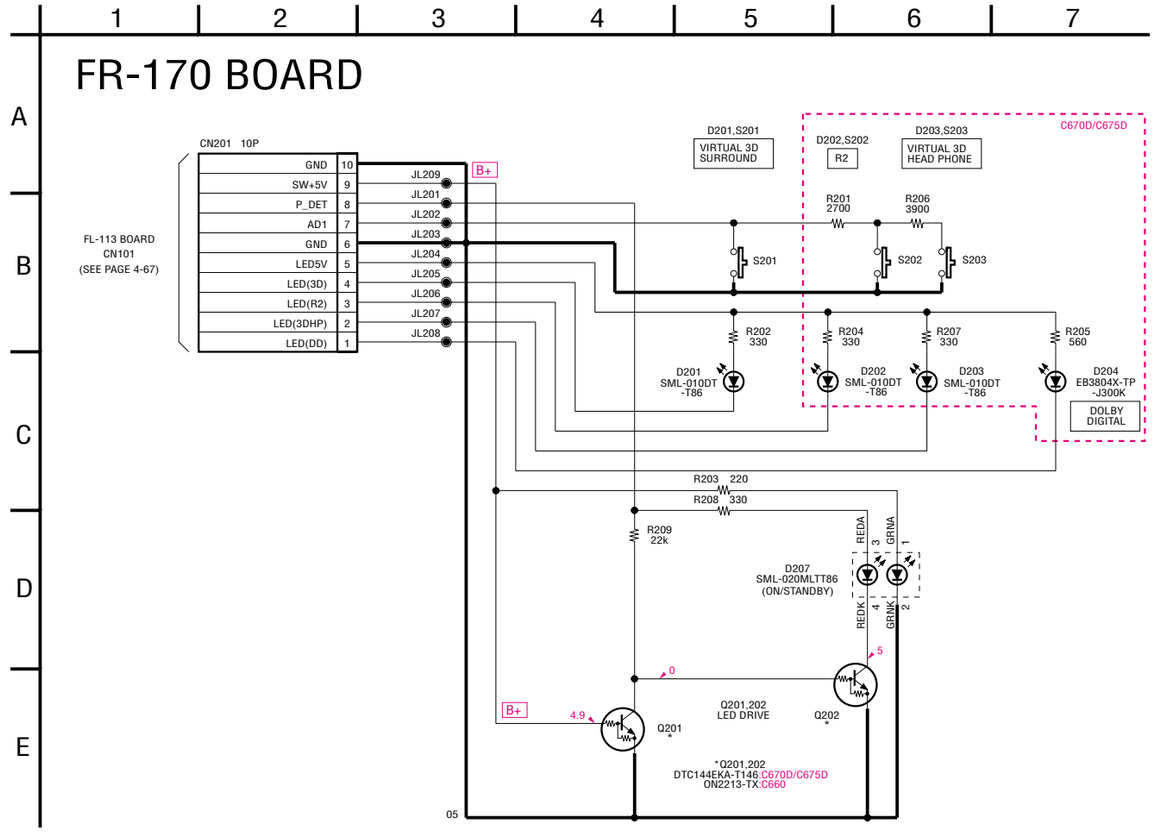
FR-170 (FUNCTION SWITCH) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: FR-170 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

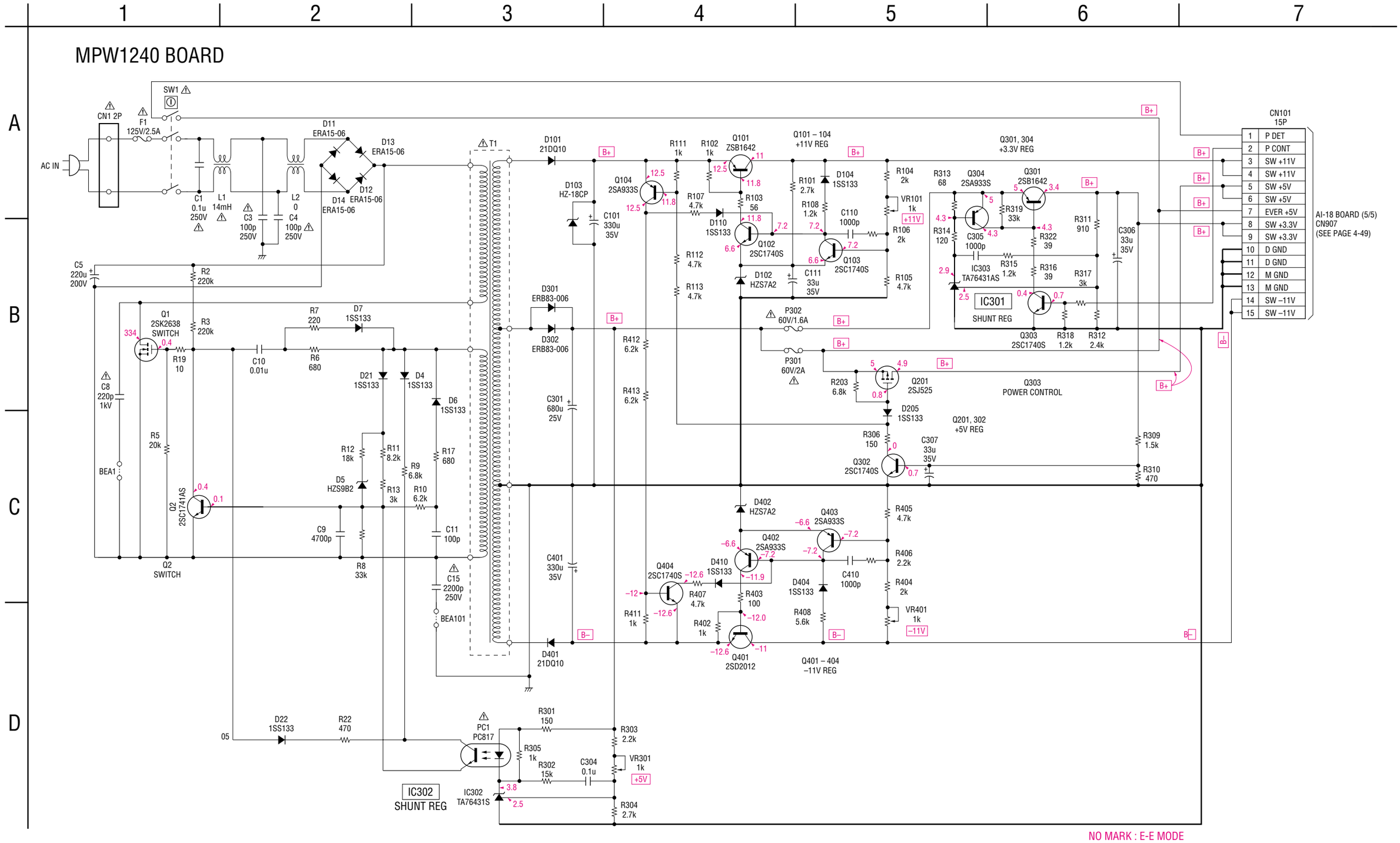






MPW1240 (SWITCHING REGULATOR) SCHEMATIC DIAGRAM

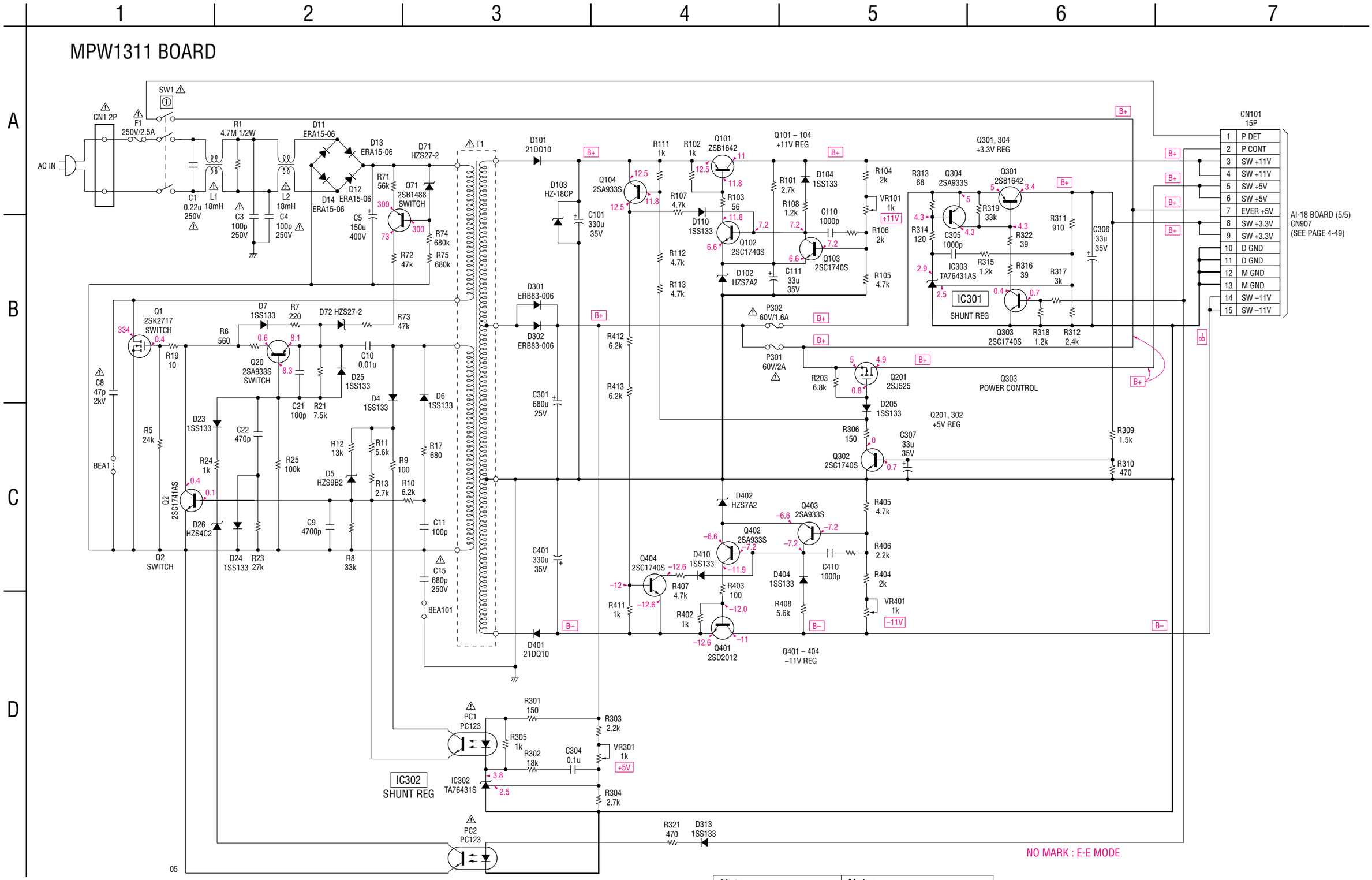
– Ref. No.: MPW1240 board; 5,000 series –



Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MPW1311 (SWITCHING REGULATOR) SCHEMATIC DIAGRAM

– Ref. No.: MPW1311 board; 6,000 series –



Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 6
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

Press [TITLE], [CLEAR], [POWER] buttons on the remote commander in this order with the power of main unit in OFF status, and the Test Mode starts, then the menu shown below will be displayed on the TV screen. At the bottom of menu screen, the model name and revision number are displayed.
To execute each function, select the desired menu and press its number on the remote commander.
To exit from the Test Mode, press the POWER button.

```
         Test Mode Menu

0. Syscon Diagnosis
1. Drive Auto Adjustment
2. Drive Manual Operation
3. Mecha Aging
4. Emergency History
5. Version Information
6. Video Level Adjustment
                Exit: Power Key
_
Model    : DPX13xxxx
Revision   : 1.xxxx
```

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander.
On the Test Mode Menu screen, press [0] key on the remote commander, and the following check menu will be displayed.

```
    ### Syscon Diagnosis ###
          Check Menu
0. Quit
1. All
2. Version
3. Peripheral
4. Servo
5. Supply
6. AV Decoder
7. Video
8. Audio
_
```

0. Quit
Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. All
All items continuous check
This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```
    ### Syscon Diagnosis ###

        Diag All Check
         No. 2 Version

 2-3. ROM Check Sum
Check Sum = xxxx



Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.
Following the message, press [NEXT] key to go to the next item, or [PREV] key to repeat the same check again. To quit the diagnosis and return to the Check Menu screen, press [STOP] or [ENTER] key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
    ### Syscon Diagnosis ###




 3-2. EEPROM Check
Error 03: EEPROM Write/Reed N
Address    : 00000001
Write Data : 2492
Read Data  : 2490
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

Press [STOP] key to quit the diagnosis, or [PREV] key to repeat the same item where an error occurred, or [NEXT] key to continue the check from the item next to faulty item.

Submenu

Selecting 2 and subsequent items calls the submenu screen of each item.
For example, if “5. Supply” is selected, the following submenu will be displayed.

```
    ### Syscon Diagnosis ###
          Check Menu
        No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
_
```

0. Quit
Quit the submenu and return to the main menu.

1. All

All submenu items continuous check
This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.
Selecting 2 and subsequent items executes respective menus and outputs the results.
For the contents of each submenu, see "Check Items List".

General Description of Checking Method

2. Version

(2-2) Revision
ROM revision number is displayed.
Error: Not detected.
The revision number defined in the source file of ROM (IC104) is displayed with four digits.

(2-3) ROM Check Sum
Check sum is calculated.
Error: Not detected.
The data are added of ROM (IC104) and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type
Model code is displayed.
Error: Not detected.
The model code is displayed with 2-digit hexadecimal number.

	Model Type	
DVP-C660 (US/CND)	4	0
DVP-C670D (US/CND), DVP-C675D (PX)	5	0
DVP-C670D (E)	5	2
DVP-C670D (AUS)	5	A

• Abbreviation
CND: Canadian AUS: Australia

(2-5) Region
Region code is displayed.
Error: Not detected.
The region code determined from the model code is displayed.
US, Canadian and PX models: 01
Australian and E models : 04

3. Peripheral

(3-2) EEPROM Check
Data write → read, and accord check
Error 03: EEPROM write/read discord
Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

(3-3) Gate Array Check
Data write → read, and accord check
Error 02: Gate array write/read discord

(3-4) NAND Flash Check
Data clear → write → read, and accord check
Error 04: Clear error
05: Write error
06: Read data discord
21: Faulty blocks exceed 10
The data clear, write, read, and check are executed to the block 0 of Flash memory (IC802).
In case of a faulty block, its address is displayed.

4. Servo

(4-2) Servo DSP Check
Data write → read, and accord check
Error 12: Read data discord

(4-3) DSP Driver Test
Test signal data → DSP Driver
Error: Not detected.

5. Supply

Caution: Do not conduct this check with a mechanical deck connected.
An access is made to the stream supply and servo control IC (IC302) and external RAM (IC303) using check data. If mechanical deck is connected, the motor and optics could be damaged. This check is also executed by the "All" menu item.

Supplement: How to disconnect mechanical deck
Disconnect flexible flat cables connected to the CN404 and CN405 of MB-87 board.

(5-2) ARP Register Check
Data write → read, and accord check
Error 08: ARP register write, and read data discord

(5-3) ARP to RAM Data Bus
Data write → read, and accord check
Error 09: ARP ←→ RAM data bus error
Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus
Data write → other address read discord check
Error 10: ARP → RAM address bus error
Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).
Before starting the test, all addresses of RAM (IC303) are cleared to 0x0000.
First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.
If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

```
    ### Syscon Diagnosis ###




 5-4. ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address    : 0000A55A
Write Data : 00000000
Read Data  : 00080000
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check
Data write → read, and accord check
Error 11: ARP RAM read data discord
The program code data stored in ROM are copied to all areas of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

6. AV Decoder

(6-2) 1930 RAM
Data write → read, and accord check
Error 13: AVD RAM read data discord
The program code data stored in ROM (IC104) are copied to all areas of RAM (IC504, IC505) connected to the AVD (IC502) through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 13, and the test is suspended.

(6-3) 1930 SP
ROM → AVD RAM → Video OUT
Error: Not detected.
The data including sub picture streams in ROM (IC104) are transferred to the RAM (IC504, IC505) in AVD (IC502), and output as video signals from the AVD (IC502).
They are output from all video terminals (Composite, Y/C, Component).

7. Video

(7-2) Color Bar
AVD color bar command write → Video OUT
Error: Not detected.
The command is transferred to the AVD, and the color bar signals are output from video terminals.
They are output from all video terminals (Composite, Y/C, Component)

8. Audio

(8-2) ARP → 1930
Error 14 : ARP → 1930 video NG
15 : ARP → 1930 audio NG

(8-3) Test Tone
A pink noise signal is output from the AVD (IC502) through optical coaxial digital terminal and analog audio terminal.
Error: Not detected.
All channels → 2ch Left → 2ch Right → Front Left → Front Right → Rear Left → Rear Right → Center → Sub Woofer are checked in this order.
Caution: Sub Woofer is checked only for low-frequency components, and no sound will be heard unless a proper super woofer is connected.

Check Items List

2) Version
(2-2) Revision
(2-3) ROM Check Sum
(2-4) Model Type
(2-5) Region

3) Peripheral
(3-2) EEPROM Check
(3-3) Gate Array Check
(3-4) NAND Flash Check

4) Servo
(4-2) Servo DSP Check
(4-3) DSP Driver Test

5) Supply
(5-2) ARP Register Check
(5-3) ARP to RAM Data Bus
(5-4) ARP to RAM Address Bus
(5-5) ARP RAM Check

6) AV Decoder
(6-2) 1930 RAM
(6-3) 1930 SP

7) Video
(7-2) Color Bar

8) Audio
(8-2) ARP → 1930
(8-3) Test Tone

Error Codes List
00: Error not detected
01: RAM write/read data discord
02: Gate array NG
03: EEPROM NG
04: Flash memory clear error
05: Flash memory write error
06: Flash memory read data discord
08: ARP register read data discord
09: ARP ←→ RAM data bus error
10: ARP ←→ RAM address bus error
11: ARP RAM read data discord
12: Servo DSP NG
13: 1930 SDRAM NG
14: ARP → 1930 video NG
15: ARP → 1930 audio NG
16: 1939 UCODE download NG
17: System call error (function not supported)
18: System call error (parameter error)
19: System call error (illegal ID number)
20: System call error (time out)
21: NAND Flash faulty blocks exceed 10
90: Error occurred
91: User verification NG
92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

On the Test Mode Menu screen, press [1] key on the remote commander, and the drive auto adjustment menu will be displayed.

```
  ## Drive Auto Adjustment ##

        Adjustment Menu

0. ALL
1. DVD-SL
2. CD
3. DVD-DL
4. SACD



                  Exit: RETURN
```

Normally, [0] is selected to adjust DVD (single layer), CD, DVD (dual layer), and SACD in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen.
The disc used for adjustment must be the one specified for adjustment. However, for SACD disc, use the player with initial data if the disc is not available.

0. ALL

You will be asked if EEPROM data are initialized or not, and for this prompt, select [0] and press the [ENTER] key, and the servo set data in EEPROM will be initialized. Then, 1. DVD-SL disc, 2. CD disc, 3. DVD-DL disc, and 4. SACD disc are adjusted in this order. Each time one disc was adjusted, it is ejected. Replace it with the specified disc following the message. Though the message to confirm whether discs other than SACD disc are adjusted is not displayed, you can finish the adjustment if pressing the [STOP] button. The S curve level, RF level, and jitter value can be confirmed during adjustment, and if OK, press the [ENTER] key and continue adjustment. (If NG, press the [STOP] button) During adjustment of each disc, the measurement for disc type judgment is made. As automatic adjustment does not judge the disc type unlike conventional models, take care not to insert wrong type discs. Also, do not give a shock during adjustment.

1. DVD-SL (single layer)

Select [1], insert DVD single layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Single Layer Disc Adjustment Steps
1. SLED TILT Reset
2. Disc Check Memory SL
3. Wait 500 msec
4. Set Disc Type SL
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Search ON
9. Focus Search OFF
10. Focus Servo ON 1
11. Auto Track Offset Adjust
12. Tracking ON
13. CLVA ON
14. Wait 1 sec
15. Sled ON
16. Check CLV Lock
17. Auto LFO Adjust
18. Auto Focus Offset Adjust
19. Auto Tilt Position Adjust
20. Auto Focus Gain Adjust
21. Auto Focus Offset Adjust
22. EQ Boost Adjust
23. Auto LFO Adjust
24. Auto Track Gain Adjust
25. All Servo Stop
26. Eep Copy Loop Filter Offset

2. CD

Select [2], insert CD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

CD Adjustment Steps

1. Sled Tilt Rest
2. Disc Check Memory CD
3. Wait 500 msec
4. Set Disc Type CD
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Search ON
9. Focus Search OFF
10. Focus Servo ON 1
11. Auto Track Offset Adjust
12. Tracking ON
13. (TC Display Start)
14. CLVA ON
15. Wait 1 sec
16. Jitter Display Start
17. Sled ON
18. Check CLV ON
19. Auto LFO Adjust
20. Auto Focus Offset Adjust
21. Auto Focus Gain Adjust
22. Auto Focus Offset Adjust
23. Eq Boost Adjust
24. Auto LFO Adjust
25. Auto Track Gain Adjust
26. All Servo Stop

3. DVD-DL (dual layer)

Select [3], insert DVD dual layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Dual Layer Disc Adjustment Steps

1. Sled Tilt Reset
2. Disc Check Memory DL
3. Wait 500 msec
4. Set Disc Type DL
5. LD ON
6. Spdl Start
7. Wait 1 sec
   Layer 1 Adjust
8. Focus Servo ON 1
9. Auto Track Offset Adjust
10. Tracking ON
11. Clva ON
12. Wait 1 sec
13. Sled ON
14. Check CLV Lock
15. Auto Loop Filter Offset Adjust
16. Auto Focus Offset Adjust
17. Auto Focus Gain Adjust
18. Auto Focus Offset Adjust
19. Eq Boost Adjust
20. Auto Loop Filter Offset
21. Auto Track Gain Adjust
    Layer 0 Adjust
22. Fj (L1 → L0)
23. Auto Track Offset Adjust L0
24. Tracking ON
25. Clva ON
26. Wait 1 sec
27. Sled ON
28. Check CLV Lock
29. Auto Loop Filter Offset Adjust
30. Auto Focus Offset Adjust
31. Auto Focus Gain Adjust
32. Auto Focus Offset Adjust
33. Eq Boost Adjust
34. Auto Loop Filter Offset
35. Auto Track Gain Adjust
36. All Servo Stop

4. SACD

Select [4], insert SACD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. However, if SACD disc is not available, use the player with initial data, skipping the SACD adjustment. In this case, you can finish the adjustment if pressing the [STOP] button.

SACD Adjustment Steps

1. Sled Tilt Reset
2. Set Disc Type CD
3. LD ON
4. Spdl Start
5. Wait 1 sec
6. Focus Servo ON 0
7. Auto track Offset Adjust
8. Tracking ON
9. CLVA ON
10. Wait 1 sec
11. Sled ON
12. Check CLV ON
13. Auto LFO Adjust
14. Auto Focus Offset Adjust
15. Auto Focus Gain Adjust
16. Auto Focus Offset Adjust
17. Eq Boost Adjust
18. Auto LFO Adjust
19. Auto Track Gain Adjust
20. All Servo Stop

6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select [2], and the manual operation menu will be displayed. For the manual operation, each servo on/off control and adjustment can be executed manually.

```
  ## Drive Manual Operation ##

         Operation Menu
1. Disc type
2. Servo Control
3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment
6. Memory Check

0. Disc Check Memory

                  Exit: Return
```

In using the manual operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type screen.
   The disc type must be set after a disc was loaded.
   The set disc type is cleared when the tray is opened.
2. After power ON, if the Drive Manual Operation was selected, first perform “Reset SLED TILT” by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the [STOP] button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

[POWER]	Power OFF
[STOP]	Servo stop
[OPEN/CLOSE]	Stop+Eject/Loading
[RETURN]	Return to Operation Menu or Test Mode Menu
[NEXT], [PREV]	Transition between sub modes of menu
[1] to [9], [0]	Selection of menu items
Cursor UP/DOWN	Increase/Decrease in manually adjusted value

0. Disc Check Memory

```
          Disc Check



1. SL Disc Check
2. CD Disc Check
3. DL Disc Check



0. Reset SLED TILT
```

On this screen, the mirror time is measured to judge the disc and it is written to the EEPROM. First load DVD SL disc and press [1], next load CD disc and press [2], and finally load DVD DL disc and press [3].
The adjustment must be executed more than once after default data were written. External vibration or shock to the player must not be given. Reference value for DVD is from 10 to 20, and for CD, from 28 to 4F.
Check that the value of CD is larger than that of DVD.
When those values are beyond a range perform this adjustment again.
From this screen, you can go to another mode by pressing [NEXT] or [PREV] key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
                        EMG. 00
```

On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting [1] automatically selects and displays the disc type. In case of wrong display, retry “Disc Check Memory”. Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.
In performing manual operation, the disc type must be set.
Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
       SA._____ SI.___ EMG. 00
DVD SL 12 cm
```

Display when DVD SL 12cm disc was selected

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
       TC.___:___:___ EMG. 00
CD   12 cm
```

Display when CD 12cm disc was selected

[0] Reset SLED TILT	Reset the Sled and Tilt to initial position.
[1] Disk Type Check	Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct. If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).
[2] to [9]	Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if [1] was selected.

2. Servo Control

```
          Servo Control
1. LD         Off R.Sled FWD
2. SP         Off L.Sled REV
3. Focus      Off U.Tilt Up
4. TRK.       Off D.Tilt Down
5. Sled       Off
6. CLVA       Off
7. FCS. Srch Off



0. Reset SLED TILT
       SA._____ SI.___ EMG. 00
DVD SL 12 cm
```

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.
The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

0	Reset SLED TILT	Reset the Sled and Tilt to initial position.
1	LD	Turn ON/OFF the laser.
2	SP	Turn ON/OFF the spindle.
3	Focus	Search the focus and turn on the focus.
4	TRK	Turn ON/OFF the tracking servo.
5	Sled	Turn ON/OFF the sled servo.
6	CLVA	Turn ON/OFF normal servo of spindle servo.
7	FCS. Srch	Apply same voltage as that of focus search to the focus drive to check the focus drive system.
→	Sled FWD	Move the sled outward. Perform this operation with the tracking servo turned off.
←	Sled REV	Move the sled inward. Perform this operation with the tracking servo turned off.
↑	Tilt UP	Move the tilt upward.
↓	Tilt DOWN	Move the tilt downward.

The following menus are normally not used.

3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment

The persons who do not know well about these menus should not use them.

6. Memory Check

```
EEPROM DATA              -- DL --
             CD SACD   SL  L0  L1
Focus Gain    xx xx    xx  xx  xx
TRK. Gain     xx xx    xx  xx  xx
Focus Offset  xx xx    xx  xx  xx
TRK. Offset   xx xx    xx  xx  xx
L. F. Offset  xx xx    xx  xx  xx
Analog FRSW   xx xx    xx  xx  xx
PLL DAC Gain  xx xx    xx  xx  xx
EQ Boost      xx xx    xx  xx  xx
Jitter        xx xx    xx  xx  xx
Mirror Time   xx       xx  xx
_            CLEAR: Default Set
```

This screen displays current servo adjusted data stored in the EEPROM. Though adjusted data can be initialized with the CLEAR key, they cannot be restored after initialization.
So, before clearing, make a note of the adjusted data.
For reference, the drive has been designed so that the gain center value is 20 and offset value is 80. Other values will be in a range of 10 to 80. If extreme value such as 00 or FF is set, adjustment will be faulty. In such a case, check for disc scratch or cable disconnection, then perform adjustment again.

6-6. MECHA AGING

```
      ### Mecha Aging ###



Press OPEN key



Abort: STOP key
```

On the Test Mode Menu screen, selecting 3 executes the aging of mechanism. First, open the tray and load a disc. Press the PLAY key, and the aging will start. When the tray is closed, the disc type and size are judged and displayed. During aging, the repeat cycle is displayed. Aging can be aborted at any time by pressing the STOP key. After the operation has stopped, unload the disc and press again the STOP key or the RETURN key to return to the Test Mode Menu.

6-7. EMERGENCY HISTORY

```
      ### MEG. History ###

Laser Hours     CD   xxxxxxxh
                DVD  xxxxxxxh

1. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

2. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

Select: 1 – 9  Scroll: UP/DOWN
(1: Last EMG.)  Exit: Return
```

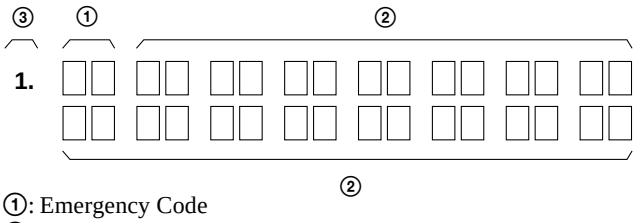
On the Test Mode Menu screen, selecting 4 displays the information such as servo emergency history. The history information from last 1 up to 10 can be scrolled with ↑ key or ↓ key. Also, specific information can be displayed by directly entering that number with ten keys.

The upper two lines display the laser ON total hours. Data below minutes are omitted.

Clearing History Information

Clearing laser hours
◎ Press DISPLAY and CLEAR keys in this order.
Both CD and DVD data are cleared.
Clearing emergency history
◎ Press TITLE and CLEAR keys in this order.
Initializing set up data
◎ Press DVD and CLEAR keys in this order.
The data have been initialized when “Set Up Initialized” message is displayed. The EMG. History screen will be restored soon.

How to see Emergency History



①: Emergency Code
②: Don't Care
These codes are used for verification of software designing.
③: Historical order 1 to 9

Emergency Codes List

10: Communication to IC201 (MB-86 board) failed.
11: Each servo for focus, tracking, and spindle is unlocked.
12: Communication to EEPROM, IC101 (MB-86 board) failed.
13: Writing of hours meter data to EEPROM, IC101 (MB-86 board) failed.
14: Communication to Servo DSP IC404 (MB-86 board) failed, or Servo DSP is faulty.
20: Initialization of tilt servo and sled servo failed. They are not placed in the initial position.
21: Tilt servo operation error
22: Syscon made a request to move the tilt servo to wrong position.
23: Sled servo operation error
24: Syscon made a request to move the sled servo to wrong position.
30: Tracking balance adjustment error
31: Tracking gain adjustment error
32: Focus balance adjustment error
33: Focus bias adjustment error
34: Focus gain adjustment error
35: Tilt servo adjustment error
36: RF equalizer adjustment error
37: RF group delay adjustment error
38: Jitter value after adaptive servo operation is too large.
40: Focus servo does not operate.
41: With a dual layer (DL) disc, focus jump failed.
50: CLV (spindle) servo does not operate.
51: Spindle does not stop.
60: With a DVD disc, Syscon made a request to seek nonexistent address.
61: With a CD disc, Syscon made a request to seek nonexistent address.
62: With a CD disc, Syscon made a request to seek nonexistent track No. and index No.
63: With a DVD disc, seeking of target address failed.
64: With a CD disc, seeking of target address failed.
65: With a CD disc, seeking of target index failed.
70: With a DVD disc, physical information data could not be read.
71: With a CD disc, TOC data could not be read.
80: Disc type judgment failed.
81: As disc type judgment failed, retry was repeated.
82: As disc type judgment failed, a measurement error occurred.
83: Disc type could not be judged within the specified time.
84: Illegal command code was received from Syscon.
85: Illegal command was received from Syscon.

6-8. VERSION INFORMATION

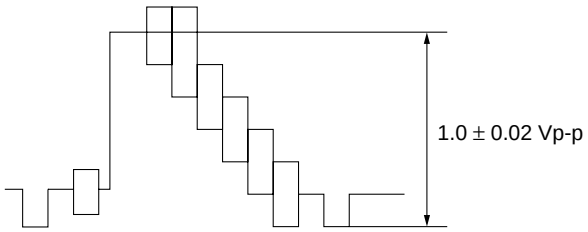
```
   ## Version Information ##

IF con.    Ver. x. xxx (xxxx)
           Group    00

SYScon.    Ver. x. xxx (xxxx)
           Model    xx
           Region   0x
Servo DSP. Ver. 1. xxxx


Exit: RETURN
```

On the Test Mode Menu screen, selecting [5] displays the ROM version and region code.
The parenthesized hexadecimal number in version field is checksum value of ROM.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting [6] displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

Measurement point : LINE OUT VIDEO
(75 Ω terminating resistance)
Measuring instrument : Oscilloscope
Adjustment device : RV501 on MB-86 board
Specified value : 1.0 ± 0.02 Vp-p



6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. FC-73 BOARD (IF CON) TEST MODE

The front board test mode is the IF CON self diagnostic mode. The IF CON can diagnose the functions of the front panel boards that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following thecommands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the Test mode, the following functions can be checked.

1. Button function
2. Remocon receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Click shuttle function
5. Fluorescent display tube lighting check
   Grid check
   Anode check
6. LED control function

In the Test mode, the set operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.

1. The routine that monitors +5 V (PCONT) of MB-87 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The set is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube (normally, display is made following the commands from SYSTEM CONTROL)
4. LED control (normally, control is made following the commands from SYSTEM CONTROL)

2. OPERATION OF SELF CHECK MODE

The Self Check mode is the function to conduct the basic test to the FL display and DVD panel section.

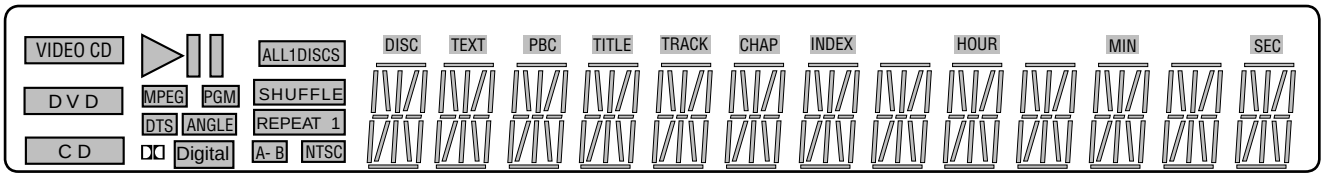
2-1. Self Check Mode Transition Processing

At the AC Power ON after IF CON was reset, the input to 26pin is judged and if “Low” is entered, the main unit transits to the Self Check mode. In this port input judgment, the result of 3-time attempts must be same (assuming that the MB-87 board is not connected). While pressing the [STOP] key on the main unit with the IF CON in STANDBY mode, enter [RETURN] → [DISPLAY] (or [SET UP]) on the remote commander, and the unit transits to the Self Check Mode. The Self Check mode terminates when the IF CON transits to the STANDBY mode.

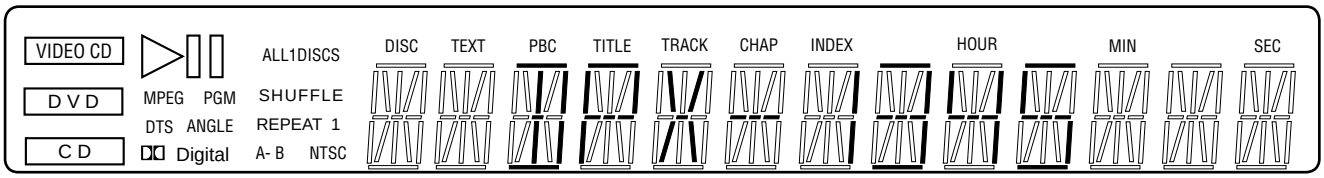
2-2. Operation of Auto Self Check

When the Self Check mode becomes active at the AC Power ON or by key input, the test display of the following steps (1) to (4) is repeated.

(1) FLD and LED all ON (for 5 seconds)



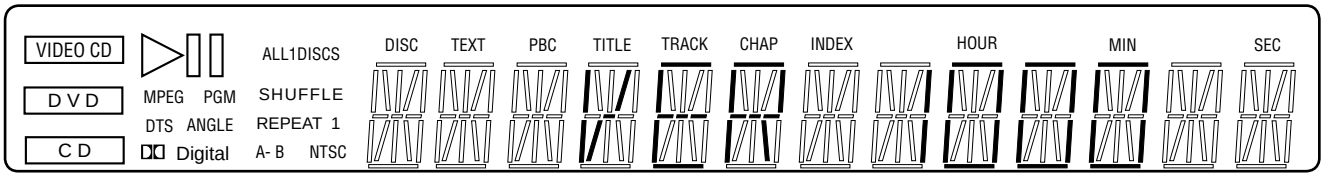
(2) MODEL display (for 2 seconds)



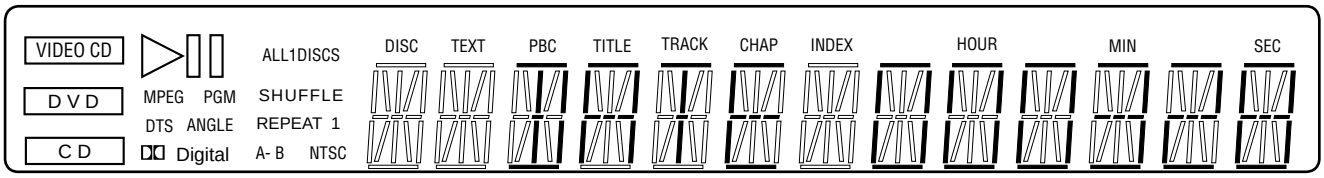
If MODEL is judged as Step UP-DD

Contents of display
"DPX-1345" Basic & DD

(3) Version display (for 2 seconds)



(4) ROM creation date display (for 2 seconds)



2-3. Each Self Check Function

Each Self Check function tests the FLD display, LED display, and key input.

Basic, Entry-DD

Input Voltage [V]	IC401: Pin No. (Signal)						
	Pin ③ (AN3)	Pin ② (AN4)	Pin ① (AN5)	Pin ⑲ (AN7)	Pin ④ (AN2)	Pin ⑤ (AN1)	Pin ⑳ (AN6)
0	STOP	DISPLAY	LEFT	RETURN	DISC 5	Virtual 3D surround	1/ALL
1	PAUSE	DISC SKIP	DOWN	DVD MENU	DISC 4	* DVE	REPEAT
2	NEXT	EXCHANGE	ENTER	TITLE	DISC 3	* Virtual 3D Head Phone	SHUFFLE
3	PREV	MEGA CONTROL	UP		DISC 2		
4			RIGHT		DISC 1		
5							

* except DVP-C660

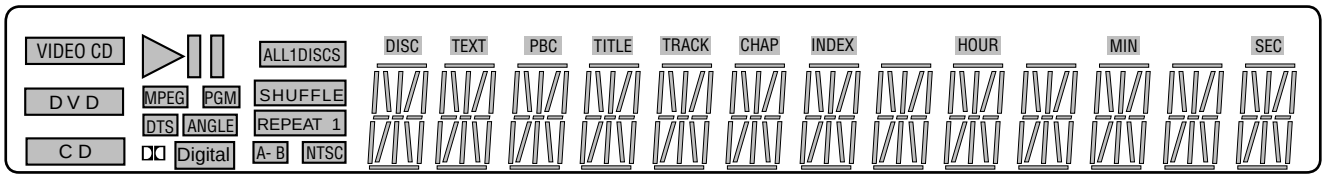
2-3-1. FLD and LED All ON

2-3-1-1. Transition Keys in Self Check Mode

- [STOP] key and [PLAY] key on the main unit
- [LEFT] key on the main unit and the remote commander

2-3-1-2. Operation and Display

In this mode, all LEDs except STANDBY LED and all segments of FLD turn ON.
Example of FLD all ON



2-3-2. Main Unit Key Name Display and Key Code Display

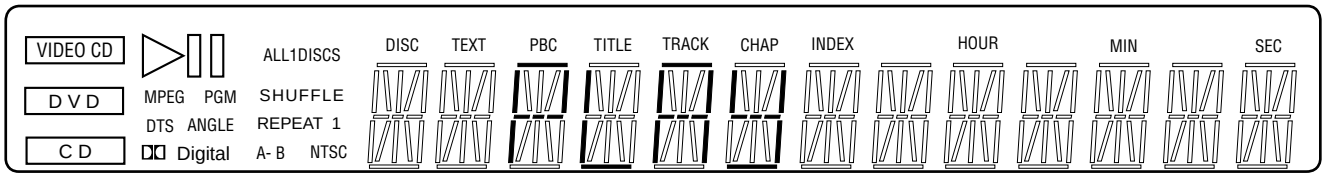
2-3-2-1. Transition Keys in Self Check Mode

- Keys on main unit except keys transited in self check

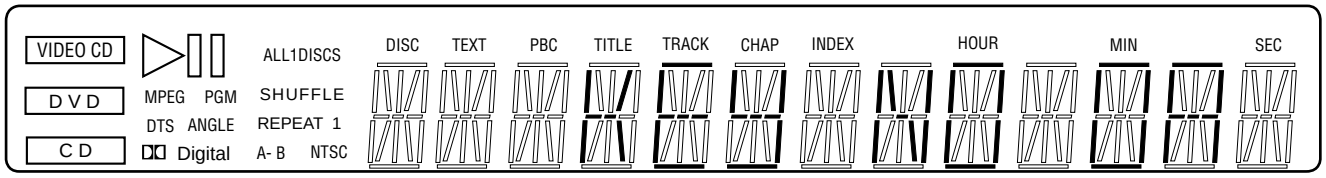
2-3-2-2. Operation and Display

When a key on the main unit is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the [DISPLAY] key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

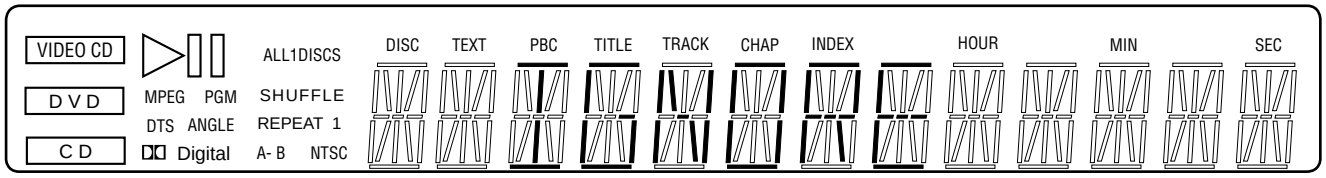
FLD display (at input of [PLAY] key on the main unit)



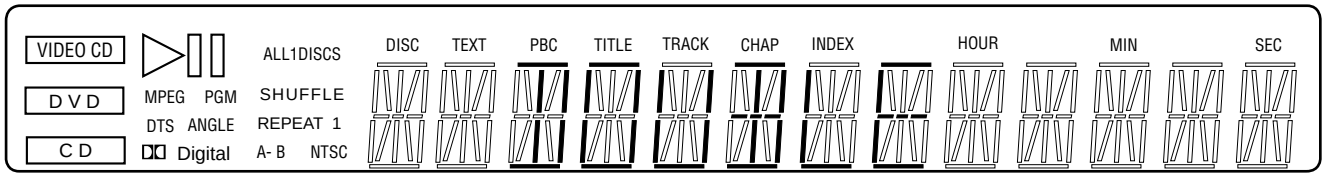
Key code display (at input of PLAY key, Key code: 0Ah)



At input of faulty voltage



When two keys are pressed



2-3-3. Remote Commander Key Name Display and Key Code Display

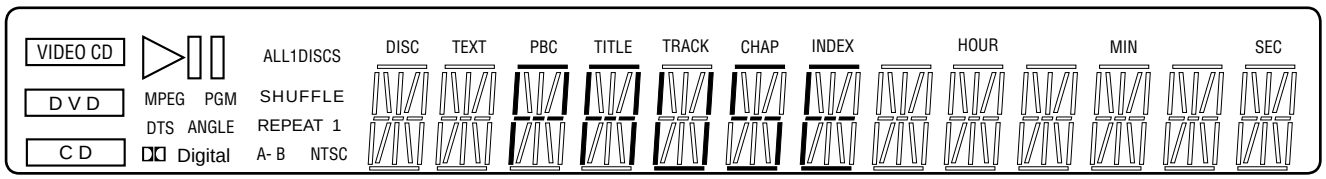
2-3-3-1. Transition Keys in Self Check Mode

- Remote commander keys except keys transited in self check

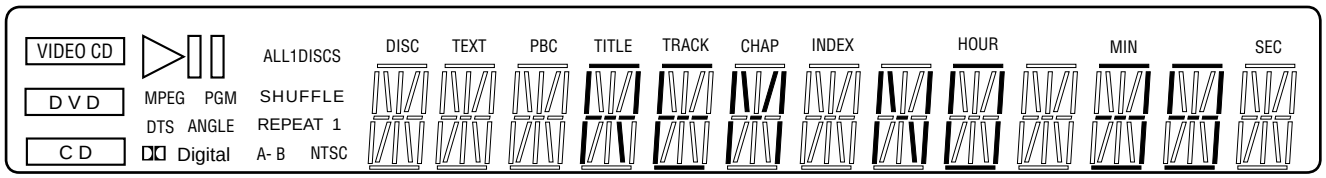
2-3-3-2. Operation and Display

When a key on the remote commander is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the DISPLAY key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

Remote commander key name display (at input of PAUSE key)



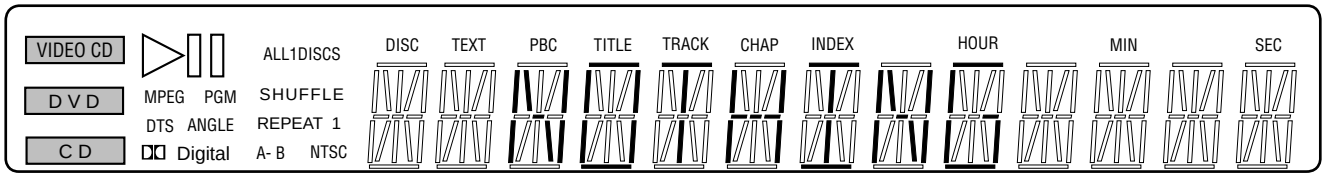
Remote commander key code display (at input of PAUSE key, Key code: 39h)



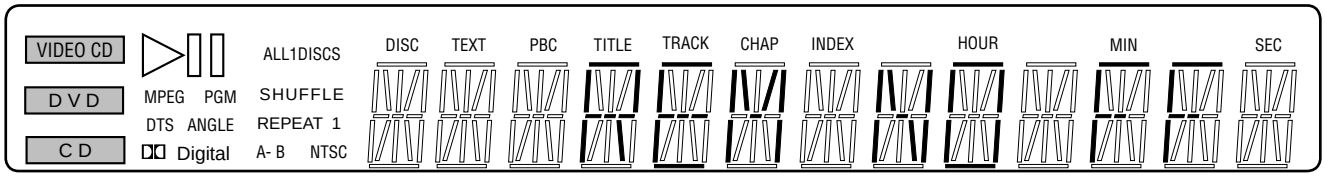
2-3-4. Communication Monitoring Display

The communication state is monitored and displayed while the key name on the main unit and the remote commander is displayed. When the communication to the System Controller failed, VIDEO CD, DVD, and CD segments turn on.

Communication error display (at no key input)



Communication error display (at code display without input of the remote commander)



2-3-5. FLD Anode Test Display and SHUTTLE Click Operation Test

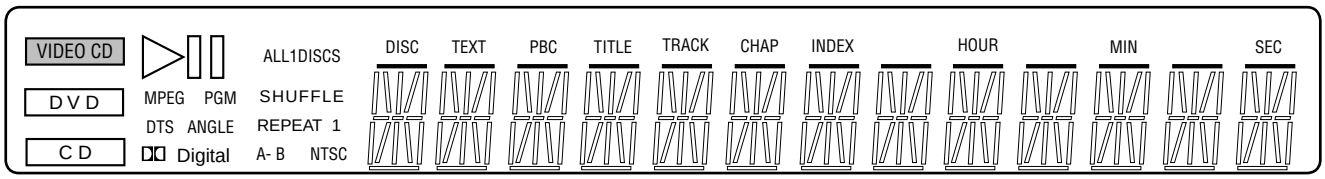
2-3-5-1. Transition Keys in Self Check Mode

- RIGHT on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during Anode Test display

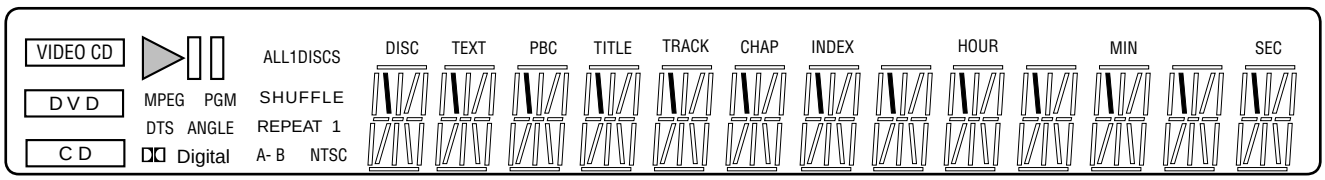
2-3-5-2. Operation and Display

The Self Check mode transits to this mode when RIGHT key is entered. Only the first segment of each grid of FLD turns on, and each time the SHUTTLE is entered, the segment of each grid is switched in order. When SHUTTLE input is clockwise, the segment switches in $1 \rightarrow 2 \rightarrow 3$ direction, or counterclockwise it switches in $3 \rightarrow 2 \rightarrow 1$ direction. This tests whether each segment turns on individually. Also, if the main unit does not have the JOG/SHUTTLE, use the remote commander JOG/SHUTTLE to switch over the segment display position.

Display at the start of Anode Test



↓ (Input in CW direction)



2-3-6. FLD Grid Test Display and SHUTTLE Click Operation Test

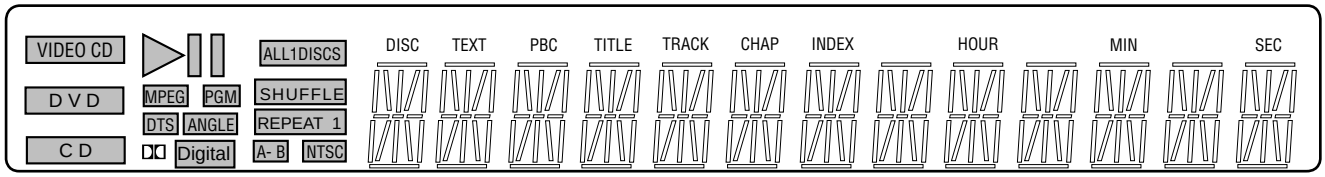
2-3-6-1. Transition Keys in Self Check Mode

- UP on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during Grid Test display

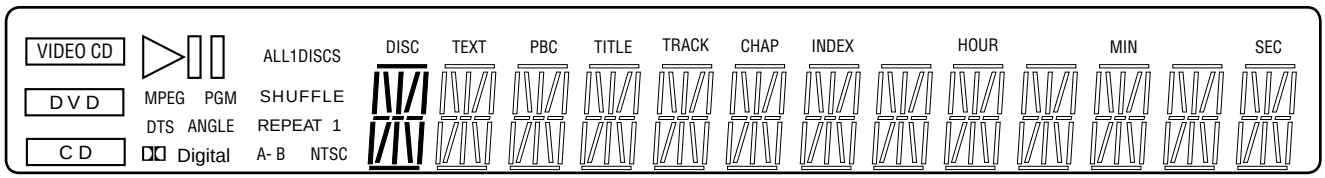
2-3-6-2. Operation and Display

The Self Check mode transits to this mode when UP key is entered. The first grid of FLD all turns on and other grids turn off. Each time the SHUTTLE is entered, the grid is switched in order. When SHUTTLE input is clockwise, the grid switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each grid turns on individually.

Display at the start of Grid Test



↓ (Input in CW direction)



2-3-7. LED Test Display

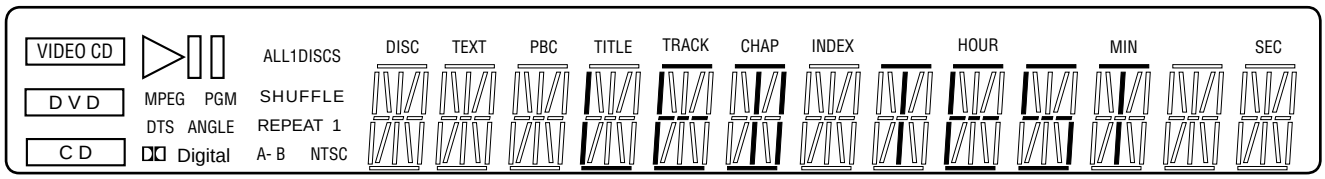
2-3-7-1. Transition Keys in Self Check Mode

- DOWN on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during LED Test display

2-3-7-2. Operation and Display

LED is switched in order by the input of JOG/SHUTTLE. Also, LED ON/OFF is switched by the input of same key as the function that turns on the LED concerned. For the MULTI LED only, there is no key which switches that function, and therefore use the RETURN key on the main unit.

FLD display during LED Test



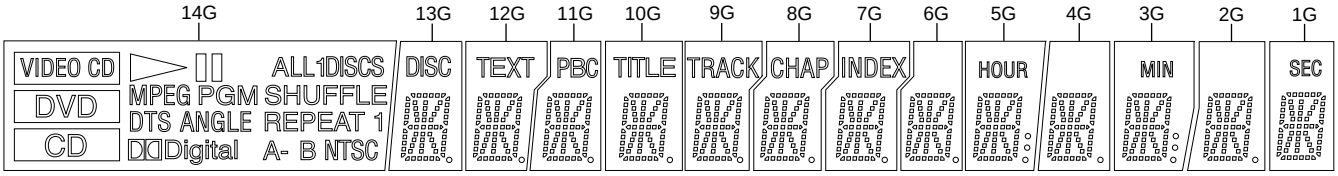
2-3-8. Beep Sound Test

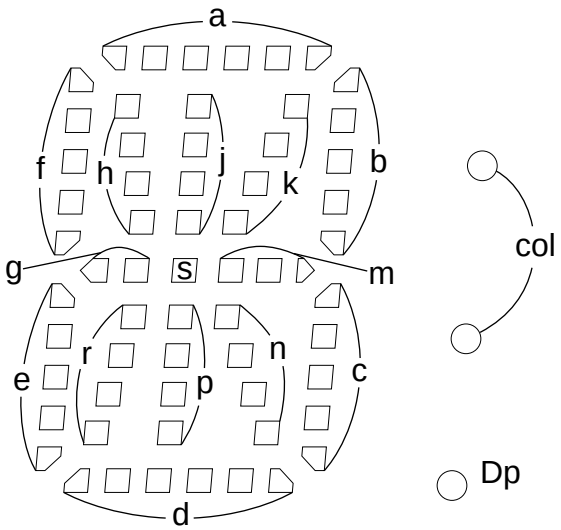
2-3-8-1. Transition Keys in Self Check Mode

- Input of a key on main unit

2-3-8-2. Operation and Display

In the Self Check mode, each time a key on the main unit is entered, a beep sound of 2kHz (100ms) is generated.





(13G~1G)

ANODE CONNECTION

	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	VIDEO CD	a	a	a	a	a	a	a	a	a	a	a	a	a
P2	▷	h	h	h	h	h	h	h	h	h	h	h	h	h
P3	▯▯	j	j	j	j	j	j	j	j	j	j	j	j	j
P4	ALL	k	k	k	k	k	k	k	k	k	k	k	k	k
P5	(ALL) 1	b	b	b	b	b	b	b	b	b	b	b	b	b
P6	DISC	f	f	f	f	f	f	f	f	f	f	f	f	f
P7	S	m	m	m	m	m	m	m	m	m	m	m	m	m
P8	DVD	s	s	s	s	s	s	s	s	s	s	s	s	s
P9	MPEG	g	g	g	g	g	g	g	g	g	g	g	g	g
P10	PGM	e	e	e	e	e	e	e	e	e	e	e	e	e
P11	SHUFFLE	n	n	n	n	n	n	n	n	n	n	n	n	n
P12	DTS	p	p	p	p	p	p	p	p	p	p	p	p	p
P13	ANGLE	r	r	r	r	r	r	r	r	r	r	r	r	r
P14	REPEAT	c	c	c	c	c	c	c	c	c	c	c	c	c
P15	(REPEAT) 1	d	d	d	d	d	d	d	d	d	d	d	d	d
P16	NTSC	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	-
P17	B	-	-	-	-	-	-	-	-	col	-	col	-	-
P18	A-	DISC	TEXT	PBC	TITLE	TRACK	CHAP	INDEX	-	HOUR	-	MIN	-	SEC
P19	Digital	-	-	-	-	-	-		-	-	-	-	-	-
P20	CD	-	-	-	-	-	-	-	-	-	-	-	-	-

3. TROUBLESHOOTING

3-1. Test Mode is not activated

With the set assembled in the front panel, the Test mode does not become active if any button was pressed by any reason.Under this condition, the power is not turned on even in the normal status. (The set is kept in Standby status = Red LED is kept on) Not only the buttons are inactive, but also a signal from remote commander is not accepted. To check this condition, with the self check port (pin ㉖ of IF CON) kept in “Low” status, supply the AC power, so that the Test mode is forcibly activated. On the board, short the lands where SELF is printed. The IF CON checks the self check port only after the power on reset (only when AC is supplied; not in Standby status). If any button was pressed, the button name should be displayed on the FL display tube. Though no button is pressed this time, display of other than NOTHING implies that the button was pressed.

3-2. Power is not turned on

① Red (STANDBY) LED does not light up when AC was supplied. The power (PDET=5 V) is not supplied.
X401 is oscillating.

② Red (STANDBY) LED is kept on though POWER button was pressed. Any button is kept pressed.
PONCHK (IF CON pin ⑥) is over 0.1 V.

③ Green LED lights up when POWER button was pressed, but red LED lights up again after several seconds. PONCHK (IF CON pin ⑥) is abnormal. (Slow rise time from 0.1 V to 2.5 V. Voltage must be less than 2.5 V)
SYSTEM CONTROL does not operate normally.

3-3. Power is turned on and off repeatedly

EVER 5 V may not be supplied normaly. Check that P301 (MPW1240/MPW1311) is not broken.

SECTION 7
ELECTRICAL ADJUSTMENT

In making adjustment, refer to 7-3. Adjustment Related Parts Arrangement.

Note: During diagnostic check, the characters and color bars can be seen only with the NTSC monitor. Therefore, for diagnostic check, use the monitor that supports both NTSC and PAL modes.

This section describes procedures and instructions necessary for adjusting electrical circuits in this set.

Instruments required:

1) Color monitor TV
2) Oscilloscope 1 or 2 phenomena, band width over 100 MHz, with delay mode
3) Frequency counter (over 8 digits)
4) Digital voltmeter
5) Standard commander (RMT-D119A/D121A/D120O)
6) DVD reference disc
   HLX-501 (J-6090-071-A) (dual layer)
   HLX-503 (J-6090-069-A) (single layer)
   HLX-504 (J-6090-088-A) (single layer)
   HLX-505 (J-6090-089-A) (dual layer)
7) SACD reference disc
   HLXA-509 (J-6090-090-A)
   Extension cable (J-6090-102-A)

7-1. POWER SUPPLY ADJUSTMENT

1. Power Supply Check (MPW1240, MPW1311 BOARD)

Mode	E-E
Instrument	Digital voltmeter
SW +5 V Check	
Test point	CN101 pin ⑤, ⑥
Specification	5.0 ± 0.2 Vdc
SW +3.3 V Check	
Test point	CN101 pin ⑧, ⑨
Specification	3.3 ± 0.2 Vdc
EVER+5 V Check	
Test point	CN101 pin ⑦
Specification	5.3 ± 0.3 Vdc
SW +11 V Check	
Test point	CN101 pin ③, ④
Specification	$11.0\ ^{+1.0}_{-1.5}$ Vdc
SW –11 V Check	
Test point	CN101 pin ⑭, ⑮
Specification	$-11.0\ ^{+1.5}_{-1.0}$ Vdc

Checking method:

1) Confirm that each voltage satisfies the specification.

2. +11 V Adjustment (MPW1240/PWB1311 BOARD)

Mode	PB
Measuring Instrument	Digital voltmeter
Measurement Point	CN101 pin ③, ④
Adjusting Element	VR101
Specified Value	$11.0\ ^{+1.0}_{-1.5}$ V

3. –11 V Adjustment (MPW1240/PWB1311 BOARD)

Mode	PB
Measuring Instrument	Digital voltmeter
Measurement Point	CN101 pin ⑭, ⑮
Adjusting Element	VR401
Specified Value	$-11.0\ ^{+1.5}_{-1.0}$ V

4. EVER +5 V Adjustment (MPW1240/PWB1311 BOARD)

Mode	PB
Measuring Instrument	Digital voltmeter
Measurement Point	CN101 pin ⑦
Adjusting Element	VR301
Specified Value	5.3 ± 0.3 V

7-2. ADJUSTMENT OF VIDEO SYSTEM

1. Video Level Adjustment (MB-87 BOARD)

<Purpose>

This adjustment is made to satisfy the NTSC standard, and if not adjusted correctly, the brightness will be too large or small.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	LINE OUT (VIDEO) connector (75 Ω terminated)
Instrument	Oscilloscope
Adjusting element	RV501
Specification	1.0 ± 0.02 Vp-p

Adjusting method:

1) In the test mode initial menu "6" Video Level Adjustment, set so that color bars are generated.
2) Adjust the RV501 to attain 1.0 ± 0.02 Vp-p.

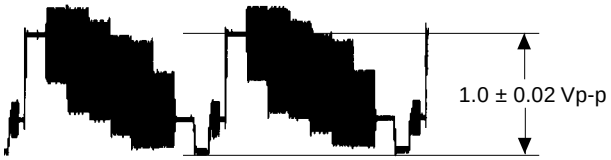


Figure 7-1

2. S-terminal Output Check (MB-87 BOARD)

<Purpose>

Check S-terminal video output. If it is incorrect, pictures will not be displayed correctly in spite of connection to the TV with a S-terminal cable.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.1 Vp-p

Checking method:

1) In the test mode initial menu "6" Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-Y level is 1.0 ± 0.1 Vp-p.

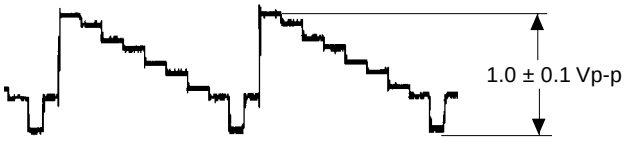


Figure 7-2

3. Checking Component Video Output B-Y (MB-87 BOARD)

<Purpose>

This checks component video output B-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (B-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	700 ± 70 mVp-p

Checking method:

1) Confirm that the B-Y level is 700 ± 70 mVp-p.

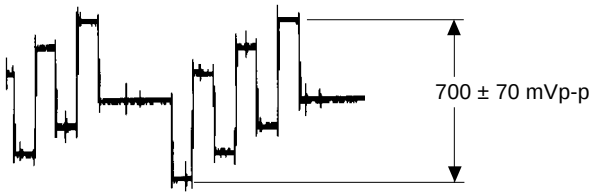


Figure 7-3

4. Checking Component Video Output R-Y (MB-87 BOARD)

<Purpose>

This checks component video output R-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (R-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	700 ± 70 mVp-p

Checking method:

1) Confirm that the R-Y level is 700 ± 70 mVp-p.

Figure 7-4

5. Checking Component Video Output Y (MB-87 BOARD)

<Purpose>

This checks component video output Y. If it is incorrect, correct brightness will not be attained when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.1 Vp-p

Checking method:

1) Confirm that the Y level is 1.0 ± 0.1 Vp-p.

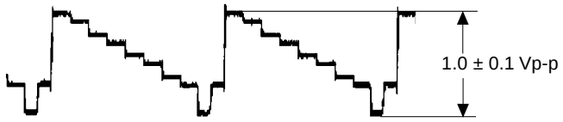


Figure 7-5

6. Checking S Video Output S-C (MB-87 BOARD)

<Purpose>

This checks whether the S-C satisfies the NTSC Standard. If it is not correct, the colors will be too dark or light.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-C) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	286 ± 50 mVp-p (NTSC) 300 ± 100 mVp-p (PAL)

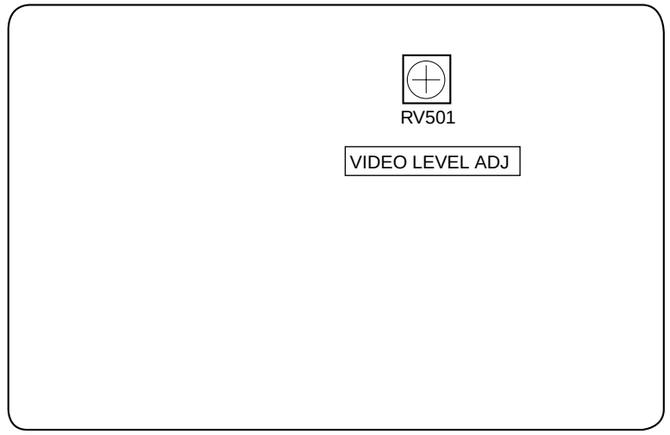
Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-C burst is 300 ± 100 mVp-p.

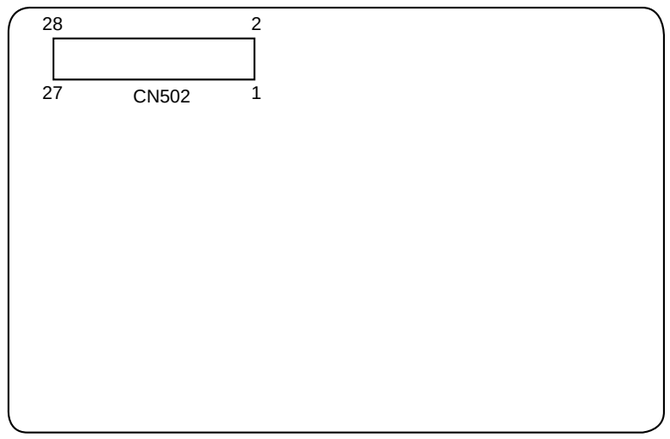
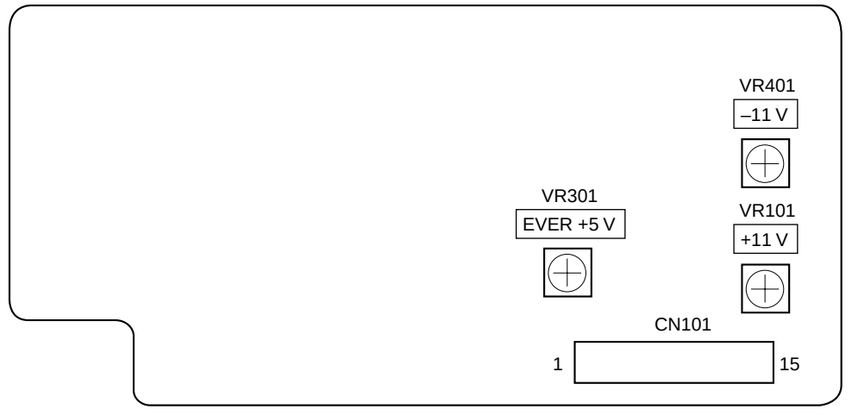
Figure 7-6

7-3. ADJUSTMENT RELATED PARTS ARRANGEMENT

MB-87 BOARD (SIDE A)



MB-87 BOARD (SIDE B)



MPW1240/MPW1311 BOARD (COMPONENT SIDE)